ARCHIVES OF OPHTHALMOLOGY.

SOME ADVANCEMENTS WITHOUT TENOTOMIES, A DESCRIPTION OF THE OPERATION EMPLOYED, AND REMARKS UPON THE THEORY OF ADVANCEMENTS IN SUCH CASES.[1]

By HERBERT WRIGHT WOOTTON, M.D.,

ASSISTANT SURGEON, MANHATTAN EYE AND EAR HOSPITAL, AND OPHTHALMOLOGIST TO THE GERMAN POLIKLINIK, NEW YORK.

(*With two figures in the text.*)

THE four following cases have been selected from a number, as exemplifying three types of muscular anomaly in which, in the opinion of the writer, advancements without tenotomies should form at least the *primary* operation. The histories are as follows:

CASE 1.—*Insufficiency of Convergence.* Mrs. D., thirty-seven years, was first seen at Drs. Pomeroy and Hepburn's clinic at the Manhattan Eye and Ear Hospital in June, 1899, complaining of poor vision and asthenopic symptoms. V O D $\frac{20}{100}$ — V O S $\frac{20}{100}$. Refraction under homatropine gave O D $\frac{20}{30}$ with — 4.50 cyl. 170°; O S $\frac{20}{40}$ + with — 4.00 cyl. axis 10°. The near point with above correction was six inches. She returned in January, 1900, complaining of asthenopic symptoms on near work. Examination of her eye muscles gave the following results: no hyperphoria, exophoria 3°, divergence one metre angle, or 7° prism, convergence only five metre angles. In other words, the muscular functions were normal, with the exception of that of convergence, which was about four metre angles deficient. February 5, 1900, I advanced the insertion of the right internal rectus to the corneal margin. On February 26th, the muscular tests gave orthophoria for distance, divergence still equal to one metre angle, but,

[1] Read before the Ophthalmological Section, New York Academy of Medicine, February 18, 1901.

whereas, before the operation the patient could not maintain fixation for objects situated nearer than 20 *cm*, she now could do so for those at 10 *cm*; or, in other words, she now possessed ten metre angles of positive convergence as opposed to five metre angles, her amplitude of positive convergence was about one metre angle more than normal instead of four metre angles deficient, her near point of convergence had been changed from 20 *cm* to 10 *cm*, and these changes in convergence had been effected without detriment to the diverging power—which still remained equal to one metre angle, or normal in amount—by an exceedingly simple operation, the result of which, up to the present time, has been permanent and has given the patient complete relief from her symptoms.

CASE 2.—*Divergent Strabismus.* F. A., fourteen years, came to my class at the German Poliklinik in May, 1900, complaining of poor vision, headaches, and intermittent diplopia. The diplopia had gradually become more and more aggravated during the past two years. V O D and O S $\frac{20}{200}$; corneal opacities partially occupied both pupillary areas. Refraction under atropine gave O D $\frac{20}{60}$ with $-$ 4. sp. $\bigcirc$ $-$ 5. cyl. axis 15°; O S $\frac{20}{60}$ with $-$ 2. sp. $\bigcirc$ $-$ 4.50 cyl. axis 165°. Muscular tests showed that the right eye diverged distinctly, but not constantly, the patient being able to maintain fixation for distant objects part of the time. On attempting convergence, the eyes diverged when the test object was brought nearer than fourteen inches, representing a positive convergence of less than three metre angles, which could not be continuously maintained. With a red glass, crossed diplopia of 18° and a vertical diplopia of 3° were readily induced. I greatly regret that the fields of fixation were not taken at this time, but as the secondary and primary deviations were apparently equal and the crossed diplopia did not increase or diminish in any direction of the gaze, I think there can be little doubt that the deviation was concomitant and not paralytic. Glasses seemed to aggravate the diplopia, while bettering distant vision, and June 25th I advanced the right internal rectus to the corneal margin, resecting a small piece of its tendon. Examination December 6th showed that the patient possessed binocular fixation and binocular single vision. There was a left hyperphoria of 2°, but no exophoria or esophoria. The abduction was slightly excessive, 12° prism. The patient maintained convergence at 10 *cm*. She was perfectly comfortable and declined further treatment.

CASE 3.—*Concomitant Convergent Strabismus.* M. S., eight years of age. First seen at my office January 20, 1901. The strabismus equalled 30° and the right eye maintained fixation. V O D $\frac{20}{50}$, V O S $\frac{1.8}{200}$. Refraction under atropine gave O D $\frac{20}{30}$ w. + .75 sp. ⊃ + 3.50 cyl. 75°; O S $\frac{20}{200}$ w. + 4.75 sp. On January 30th at my request, Dr. Meanor, the house surgeon of the Manhattan Eye and Ear Hospital, advanced both external recti to the corneal margin, resecting the tendon of the externus of the squinting eye. The eyes were bandaged for a week, atropine being instilled, at the end of which time the atropine was discontinued and the correcting glasses substituted. Examination February 17th showed perfect parallelism with binocular fixation for distance and for near points. The fields of fixation, which before operation showed an external rotation of less than 40° and an internal rotation of 50° for each eye, after operation showed an external and internal rotation of about 55 for each eye respectively.

CASE 4.—*Concomitant Convergent Strabismus.* A. F., seven years, came to Drs. Pomeroy and Hepburn's clinic at the Manhattan Eye and Ear Hospital in June, 1900, with convergent strabismus of 25°. The left eye maintained fixation and diplopia could not be induced. V O D $\frac{1.0}{200}$, V O S $\frac{20}{20}$. Refraction under atropine with the retinoscope gave O D $\frac{20}{100}$ with + 1.50 sp.; O S $\frac{20}{20}$ with + 2.25 sp. The patient wore this correction six months but with slight improvement, and December 1st I advanced both external recti to the corneal margin, resecting the tendon of the squinting eye. Immediately after the operation, there was marked divergence, which disappeared at the end of a week. Both eyes were kept bandaged during this time, and atropine was instilled for about a fortnight, when its use was gradually discontinued and the correcting glasses substituted. January 3d, 1901, the cosmetic effect during distant vision seemed perfect, during convergence the right eye squinted slightly. Homonymous diplopia, at first with a red glass, later without it, was readily induced. Stereoscopic exercises were instituted in the hope of re-establishing binocular single vision, with the result that she readily learned to fuse the images, but when examined about a week ago, although she undoubtedly possessed binocular fixation at times for distance, she still squinted slightly during convergence. The cosmetic effect, however, is certainly excellent, and considering the fact that the case presents such wide difference in visual acuteness

between the two eyes, and also that the amblyopia was undoubtedly congenital, the result seems to the writer to be fairly good. Certainly, with such a slight degree of convergence remaining in a child seven years of age, who can fuse stereoscopic images, it would seem wiser to trust to the glasses to effect a perfect cure rather than to attempt further operative procedures.

The operation employed by the writer in the second and fourth cases, by Dr. Meanor in the third, and by the writer in a number of others, differs slightly from those usually described and seems to present some advantages, inasmuch as the reaction is decidedly less than is usually observed, and the resulting disfigurement is less marked and of shorter duration. It is not difficult to perform, and both externi or both interni can be advanced in twenty minutes. The primary incision, as in Landolt's operation, is made about one millimetre from the corneal margin, and not, as is generally the case, in the neighborhood of the muscular insertion. It is continued above and below parallel to the margin of the cornea as far as the vertical meridian in cases of actual squint, but in cases of insufficiency, this incision need not be so extensive. The conjunctiva is then freed from the underlying structures, towards the canthus, to a point somewhat beyond the muscular insertion, and, when the vertical incision is of full length, this flap can be pushed towards the canthus or can be held away from the globe by an assistant, exposing the point of insertion clearly to view, but when the vertical incision is shorter, the field of operation is rendered more distinctly visible by two incisions, one above, the other below, running from the extremities of the primary incision towards the canthus and converging somewhat as they leave the cornea. Tenon's capsule is now picked up with the forceps at the lower border of the tendon, close to its insertion, and a small opening made in it with the scissors, through which a strabismus hook is passed under the tendon, and a second incision in the capsule frees the point of the hook as it appears at the tendon's upper border. An incision is now made through Tenon's capsule above and below, running from the hook towards the canthus, following the borders of the muscle and corresponding in length to

the extent of tendon which it is thought desirable to resect, and this length of tendon is freed from the sclerotic with the closed points of the scissors. In cases of insufficiency, this resection is unnecessary. Whether the external or internal recti are to be advanced, the effect is greatest when three sutures are employed, and each is armed in the usual way with two needles. The sutures should be of silk and not finer than number five, as finer threads are apt to cut

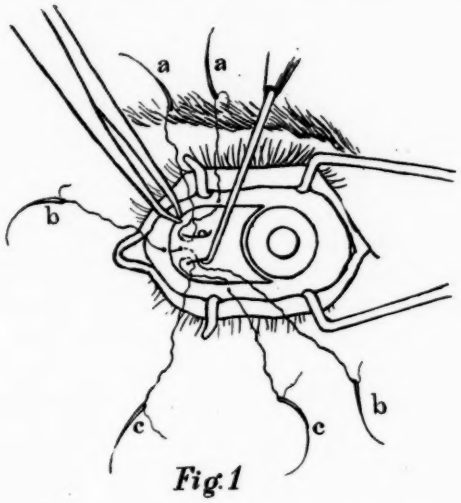


Fig. 1

their way out when this operation is performed without tenotomy of the opposing muscle. The first suture is passed from above, under the free edge of the tendon and through its middle and as far back as it has been freed from its attachments to the structures beneath, and then through the conjunctiva, not at a point corresponding to the muscular insertion but about one millimetre from the conjunctiva's cut edge, on a line corresponding to the horizontal meridian of the cornea. A second suture passed similarly from above through the tendon near its upper border penetrates the conjunctiva near the edge of the vertical incision, in the neighborhood of its upper extremity, and the third suture,

passed through the tendon near its lower border, penetrates the conjunctiva in like manner below. The accompanying illustration (Fig. 1) may make this somewhat clearer. The tendon is now cut close to the points penetrated by the sutures. The operator should of course be careful not to cut the sutures, but, on the other hand, he should be equally careful to leave no great extent of tendon between his incision and the line of the sutures, lest it project between the edges of the conjunctival incision when these are brought together. In operating for insufficiency, the sutures should penetrate the tendon close to the hook and the tendon should be cut on the corneal side of the latter, disturbing as little as possible the structures beneath. The needles at the other ends of the sutures are now passed through the conjunctiva and superficial layers of the sclerotic as close as possible to the corneal margin, at the upper extremity, in the middle, and at the lower extremity of the conjunctival incision respectively. The sutures are now tied, advancing the insertion of the muscle quite up to the corneal margin, while an assistant diminishes the strain during the tying process by rotating the globe towards the side operated upon. Fig. 2 shows the hook removed, the tendon resected, and the sutures ready for tying. In the absence of infection, the reaction is surprisingly slight. The sutures may be removed in six or seven days, during which time the eyes, especially when both are operated upon, should be kept bandaged, the dressings being changed every twenty-four hours. In convergent cases, one need not fear to instil atropine, even when marked divergence is apparent at the conclusion of the operation, the correcting glasses being worn and the atropine discontinued when the sutures are removed. The advantages of this method of advancement, though perhaps slight, seem to the writer to be real. The superior and inferior attachments reaching nearly to the vertical meridian of the cornea, the effect is as great as that of the Agnew, while the closeness of the conjunctival incision to the corneal margin allows with great certainty the approximation of the tendon's severed edge. No conjunctiva is removed, and, while the tendon is snugly covered, no disfiguring bunch of conjunc-

tival tissue remains. The cosmetic effect is remarkably good, and at the end of three weeks, the site of the operation is not more noticeable than that of a somewhat extensive tenotomy. Furthermore, the inferior surface of the muscular sheath is not interfered with, a point which I consider of the utmost importance.

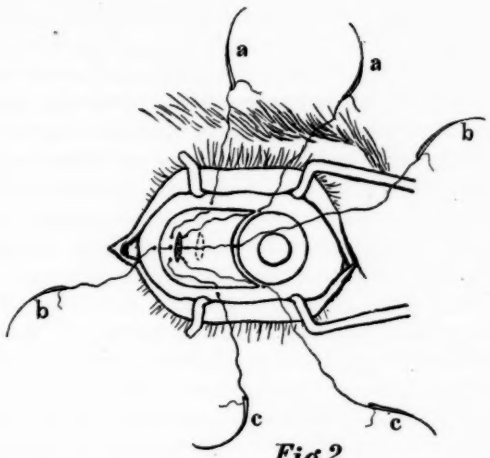


Fig 2

The first two cases, one in which binocular vision still existed, the other in which divergence had actually taken place, may well be considered together as representing different degrees of the same affection. They were both treated by the same operative procedure, an advancement of one internal rectus, on the theory that in both the primary and essential error was an insufficiency of converging power. After operation an excess of diverging power was present in the second case, and has been present in all the cases of divergent strabismus which I have operated upon by this method, and this made me think that perhaps, in most cases of divergent strabismus, two muscular conditions, if not absolutely essential, are at least, when combined, most favorable for their production,—an insufficiency of convergence and an excess of divergence. Is the excess of

divergence remaining in the second case a primary or a secondary condition, will it disappear, remain stationary, or increase? These are questions which time alone can answer. Certainly it would seem that an uncomplicated excess of divergence when moderate in degree, beyond producing occasionally diplopia for distance, is apt, so long as the convergence shall remain normal, to occasion the patient but little trouble, and every one must remember many cases in which, after the correction of some refractive error, the fact that the patient could overcome, say, a 14° prism in abduction, has been the source of no particular annoyance to him. In these cases, however, the convergence will invariably be found to be normal, or nine metre angles, the near point being about 11 *cm* from the eyes, and Landolt has pretty conclusively shown that a converging power of this amount is necessary to enable a person to maintain a binocular fixation without fatigue for considerable periods of time at ordinary reading or working distances. The first patient possessed a positive convergence of five metre angles. Three fifths of her total power of convergence had, therefore, to be employed at near work. Her asthenopic symptoms are not to be wondered at, and as her diverging power was normal and there was no vertical deviation, an advancement of one internal rectus seemed proper under the circumstances, and it would also seem that any tenotomies of the externi were distinctly contra-indicated. The result was certainly exceedingly satisfactory.

In the second case, divergence had actually taken place and was present most of the time. On extreme effort the patient could converge somewhat, but she could not maintain parallelism for distance habitually and could only momentarily do so for near. A vertical deviation was also present but, as it was slight, it was decided to disregard it for the time being, and the more important error, the insufficiency of convergence, was attacked. As the lateral deviation was not great,—18° as measured by the diplopia,—but one internal rectus was advanced; had it been greater, I should have advanced both interni rather than have done a tenotomy of the externus of the squinting eye. The result was

most excellent, the vertical deviation remaining, however, as a hyperphoria, which could have been remedied by a tenotomy had the patient so desired.

The third and fourth cases, both cases of well-marked convergent strabismus, due to hypermetropia and to amblyopia, which was probably congenital, require a little different consideration. In the divergent case, the *primary* muscular error was attacked; in the convergent cases, the condition treated by operation was probably *secondary*. The primary and essential error in convergent strabismus is undoubtedly an excess of convergence, but it will be found associated with an insufficiency of divergence, particularly in well-marked cases and in those of long standing. The operative procedure was that so strongly advocated by Landolt. By advancing the externi in these cases, we seek to restore the diverging power, weakened by disuse, while the converging power is left intact. In fact, we strive to place the eyes in the condition in which they were before the squint became permanent, relying upon correction of the refractive error to diminish the excessive convergence due to hypermetropia. That an insufficiency of divergence does exist in most cases of permanent convergent strabismus is supported by an examination of the monocular fields of fixation, the temporal excursions being decidedly restricted, that of the squinting eye generally the more so, while after the advancement of the externi, the temporal excursions will be found normal or somewhat excessive and no diminution of the nasal excursions will be apparent.

Advancements done in appropriate cases, without tenotomies of the opposing muscles, as first advocated by Landolt in 1878, seem to the writer to present certain distinct advantages, and he believes that they ought to form at least the *primary* operation in most cases of strabismus, and certainly in those cases, divergent or convergent, in which the difference in visual acuity between the eyes is not so great as to render the re-establishment of binocular single vision practically impossible. In the first place, they seem merely to increase the power of the *function* presided over by the muscles advanced, and do not appear to be capable of

producing a permanent deviation of opposite character. In other words, they do no harm. In all cases, the muscular attachment should be advanced quite to the corneal margin, and any amount of over-effect apparent immediately after the operation will rapidly disappear. It is easy to understand why this should be so. As Landolt points out, the centre of rotation of the eye is *not* a fixed point and the shortening of the muscle effected at the time of the operation by advancing its insertion is quickly compensated for by the recession of the globe into the orbit, a result which is very easily observed. The sum-total of the permanent effect of such an advancement seems to the writer to be due, therefore, not to the shortening produced by the advancement of the muscular insertion, nor to the shortening effected by excision of a portion of tendon moderate in length, but simply to the better leverage afforded by the new insertion. It may be argued that, as the sclera between the cornea and the original attachment must be denuded, the under surface of the advanced muscle might become connected with the sclera as far back as the original insertion, and that, in consequence, the real insertion after the operation would not differ materially from what it was before. In such a case, the effect produced would depend alone upon the shortening of the muscle and, in the writer's opinion, would be mostly temporary. That this *may* take place is of course possible, but I believe that it only does so when the under surface of the muscular sheath is damaged, and it is for this reason, in the operation just described, that the under surface of the muscle is not interfered with. In other words the writer believes that the operation to be permanent in its results must *advance* not *shorten*, and he therefore excises but a moderate amount of the tendon,—only enough presumably to restore the stretched and atonic muscle to its original length. It also seems to him that, generally speaking, divergent strabismus is due primarily to an insufficiency of convergence, and that convergent strabismus is perpetuated by an insufficiency of divergence, and that, in each case, we should strive to augment the power of the weakened function by increasing the leverage with which

it acts; that the primary operation should be an advancement of a single rectus if the squint be slight or periodic, but generally speaking of both, and that with the re-establishment of the power of convergence on the one hand, or the power of divergence on the other, we may reasonably hope for a return of binocular vision when the visual acuity of the deviating eye is not comparatively too low. Subsequent operations may, of course, be advisable, depending upon the degree of muscular equilibrium restored by the advancement, and particularly is this so when, as is frequently the case, the lateral deviation is accompanied and perhaps aggravated by a vertical deviation of moderate degree; but in cases possessing good vision, the advancement brings these errors under the domain of latent anomalies and they can be dealt with accordingly.

Tenotomies, as primary operations, particularly in convergent cases, are at best hazardous procedures. Apparent parallelism, for the time being, is frequently obtained, but almost always with great sacrifice of the power of convergence. In general, however, even this parallelism is merely apparent, binocular fixation is not really present, and in the few cases in which binocular single vision is found to exist, it is frequently subsequently lost. The reason for this is not difficult to understand. The convergence having been rendered insufficient by the operation, the patient suffers from asthenopia at near work, in consequence of which he gradually abandons binocular fixation, at first for near objects, later for those at a distance, and the eye with the poorer vision diverges. In fact, the case, at first one of convergent strabismus, has become one of insufficiency of convergence, and later one of divergent squint. The operation, one might almost say, has attempted to cure the causative factor, the hypermetropia, by superadding a pathological condition, a relative insufficiency of convergence, ignoring the fact that an excess of converging power is a normal condition with an *uncorrected* hypermetropia. Advancements in such cases produce no insufficiency of any of the associated functions of the eyes, and seek merely to restore the *status quo ante*. Furthermore, the mobility of the eyes, the extent of their

lateral rotations, is not limited by such operations, and any one who will take the trouble to map out the fields of fixation in these cases, can assure himself that the advancement of one of the straight muscles of the eye does not restrict the action of its so-called antagonist.

ALCOHOL AND TOBACCO AMBLYOPIA IN CUBA.[1]

By Dr. C. E. FINLAY, Havana.

MY experience during the eight years that I have been practising in Cuba being utterly at variance with the authoritative statements hitherto made in connection with the alleged immunity of the Cubans and Spaniards from tobacco amblyopia,[2] I beg to present to this congress a series of ninety-two (92) cases of alcohol and tobacco amblyopia which I have come across in my personal practice in a total of four thousand three hundred (4300) cases. Among these, only those cases are considered in which more or less permanent damage has been brought about by a more or less prolonged intoxication by one or both of the above-mentioned poisons, transient disturbances not having been taken into consideration. These cases are presented in tabular form at the end of this paper. A careful examination will show that in a certain number the determination of the etiological factor was not easy, and possibly my judgment at fault; I have, however, endeavored to discriminate as carefully as possible.

OCCURRENCE.

Race: I have found a marked preference of the disease for the white race, the alleged immunity of the Spanish race not existing; thus, of my ninety-two (92) cases:

[1] Read before the Pan-American Medical Congress at Havana, Dec. 26-29, 1900.

[2] De Wecker, *Traité Complet d'Ophtalmologie* (De Wecker et Landolt), iv., 457; Santos Fernandez, Soc. d' Opht. de Paris, Nov. 3, 1891; De Schweinitz, *A System of Diseases of the Eye* (Norris and Oliver), iv., 804.

75 occurred in Cuban or Spanish whites,
2 " " North American whites,
2 " " French whites,
5 " " Cuban mulattoes, and
8 " " Cuban blacks.
—
92

This preference for the white race is more apparent than real, for the colored race in Cuba, being much less highly educated than the white, is less apt to seek improvement for not very marked visual defects, not demanding as much from their eyes as the better instructed whites; at the same time their lower social and economic status precludes much self-indulgence.

Sex: My experience in this respect is in accordance with that of other observers, the great majority of my cases having occurred among males, which is what one would expect on considering the difference in habits. Thus:

85 cases occurred in men, and
7 " " " women.
—
92

Age: As regards age, I have found the affection also to be in accordance with the usual habits, being more prevalent between thirty and fifty years, especially between thirty and forty. Thus:

11 cases occurred between 20 and 30 years of age.
35 " " " 30 " 40 " "
22 " " " 40 " 50 " "
15 " " " 50 " 60 " "
9 " " " 60 " 70 " "
—
92

Etiology: As regards the particular toxic agent, I found:

5 cases of pure alcohol amblyopia,
31 " " tobacco amblyopia, and
56 " mixed alcohol and tobacco amblyopia.
—
92

In two of the *pure alcohol cases*,[1] a general running down of the system by malnutrition and fevers seems to have acted as a predisposing agent.

In four of the thirty-one *tobacco cases*, the origin of the amblyopia may be considered doubtful. In two[2] there was a total atrophy of the optic nerves with a history of tobacco abuse, no other cause being discoverable. In one[3] in which the patient, besides being a workman in a factory, gave a history of excessive tobacco smoking, it was difficult to determine whether amblyopia was due to the tobacco or to fevers or quinine. In one case, finally,[4] it was doubtful whether the diminution in sight was due to the abuse of tobacco or to loss of blood from hemorrhoids.

Two of the *pure tobacco cases* deserve especial notice on account of the intoxication having taken place not through smoking but through aspiration of the fumes of tobacco in a factory.[5] One of these cases particularly (Case 6) was typical, with an absolute central scotoma.

In four of these *tobacco cases*,[6] malnutrition or loss of blood may have acted as predisposing agents.

Of the *mixed cases*, three are of doubtful etiology. In one it was difficult to determine whether the affection should be ascribed to abuse of alcohol and tobacco or to syphilis,[7] another was ataxic,[8] and in the third[9] it was doubtful whether the diminution in sight ought not to be attributed to fevers or quinine.

Two of the cases,[10] besides giving a history of abuse of alcohol and tobacco smoking, deserve special notice, one being a workman in a tobacco factory and the other in a distillery.

Fevers and exposure may have acted as predisposing agents in four of these *mixed* cases.[11]

SYMPTOMS AND COURSE.

The symptoms which these cases presented were for the most part the usual ones, viz: diminution in the visual acuity, central scotoma at first for red and green and finally,

[1] Cases 29 and 77.
[2] Cases 2 and 28.
[3] Case 67.
[4] Case 90.
[5] Cases 6 and 20.
[6] Cases 2, 67, 70, and 90.
[7] Case 13.
[8] Case 18.
[9] Case 76.
[10] Cases 15 and 86.
[11] Cases 3, 23, 61, and 73.

if the case is allowed to go on, absolute; the ophthalmoscopic signs, when present, being pallor of the temporal quadrant of the optic nerve, in advanced cases leading to a partial atrophy of the temporal quadrant.

As regards the course, the cases are divisible into *acute*, where the loss of sight takes place more or less rapidly, and *chronic*, where this occurs more slowly; both forms may lead to a partial or total atrophy of the optic nerve. The cases may be grouped as follows:

Acute cases	23
Chronic cases	48
Cases of partial atrophy	17
" " total "	4
	92

Special attention is called to Case 10, which was an acute case observed from the start and which, notwithstanding most energetic treatment, led to total blindness of both eyes.

TREATMENT.

This consisted almost universally of: Total abstinence from alcohol and tobacco (no reduction in the amount will do), and the internal administration of iodide of potassium and strychnia.

RESULTS.

These I have considered as *good* when a distinct improvement in the diminished visual acuity has been brought about, as *moderate* when this has been slight or none at all but the diminution has not progressed, and as *bad* when the visual acuity has continued to diminish in spite of the treatment.

Of the forty-five cases which I have been able to follow, the results have been:

Good in	25 cases
Moderate in	16 "
Bad in	4 "
	45 "

NO.	DATE.	INITIALS.	RACE.	SEX.	AGE.	ETIOLOGICAL FACTORS.	PREVIOUS DURATION.	FORM OF AFFECTION. PROMINENT SYMPTOMS.	TREATMENT.	RESULT.	OBSERVATIONS.
1	21 XI 93	J. L. T.	W.	M	35	Chr. alc.	1 day.	Ac. exacerb. of chr. retr. neuritis. O. U. Atrophy temp. quadr. of O. N. Diff. haziness of disk and neighb. ret. arts. very narrow. V: P. of L.			Pat. adm. to Mercedes Hospital 16 XI w. alc. "pelagra" S: failing for some time. 20 XI awoke totally blind.
2	5 III 94	C. N.	N.	M	38	Abuse of tob. Fevers. No alc. No syph.	6 months.	Total atr. neuritis. V. O. U: Mov. of hds.	Abst. K. I.		?
3	9 VI 94	A. S.	C.	M	39	Abuse of alc. and tob. Malnutrit. expos.	R. 12 yrs. L. 1½ yrs.	Chr. retr. neuritis. R. Part. atr. O. N. (temp. quadr.) Absol. centr. scotoma. V: $\frac{5}{200}$. No col. percept. L. Part. atr. O. N. (temp. quadr.) V: $\frac{15}{10}$. No percept. of red or green.	Abst. K. I. Strych.	I VI 97 R. Mov. hds. in extr. periph. V. F. L. $\frac{1}{200}$ exc.	Doubtful whether followed treatment.
4	25 IV 95	F. V.	Sp.	M	60	Abuse of tob. and alc.	2 months.	Chr. retr. neuritis. Fundi: Normal. V: $\frac{15}{100}$.	Abst. K. I.		Onset more or less sudden.
5	5 VII 95	J. P.	W.	M	28	Enorm. ab. of tob. Abuse of alc.	2 months.	Chr. retr. neuritis. Fundi: Normal. R. $\frac{15}{70}$ Centr. scot. for red. L. $\frac{15}{80}$.	Abst. Strych. Tonics.		
6	31 VII 95	L. R.	Sp.	M	32	Works in tob. fact. Denies ab. alc. and tob.	1 year.	Chr. retr. neuritis. O. U. Part atr. O. N. R. $\frac{15}{70}$. L. $\frac{5}{200}$. Abs. centr. scot. No pat. reflex.	Abst. K. I. Strych.	22 XII 95 R. $\frac{15}{80}$ L. $\frac{15}{200}$ Scot. smaller	

NO.	DATE.	INITIALS.	RACE.	SEX.	AGE.	ETIOLOGICAL FACTORS.	PREVIOUS DURATION.	FORM OF AFFECTION. PROMINENT SYMPTOMS.	TREATMENT.	RESULT.	OBSERVATIONS.
7	23 XII 95	F. C.	W.	M	52	Ab. alc. tob.		Chr. retr. neuritis. R. Part. atr. O. N.; V : $\frac{1}{200}$. L. Opt. neuritis ; V : $\frac{8}{200}$.	Abst. Nux. vom.		
8	8 IV 96	P. G.	Sp.	M	59	Ab. tob. (16 cigars.) No alc.	8 months.	Chr. retr. neuritis. Fundi : Normal. Scot. R. $\frac{15}{70}$. L. $\frac{15}{60}$.	Abst. K. I. Strych.		
9	7 V 96	M. G.	Sp.	M	40	Ab. of tob. No alc. No expos. No syph.	2 months.	Chr. retrob. neuritis. Fundi : Slight pallor of O. N. R. $\frac{8}{200}$. L. $\frac{12}{200}$. V. F. normal. No col. scot.	Abst. Strych. K. I. Na. salicyl.	28 VI 96. R. $\frac{15}{60}$. L. $\frac{15}{40}$.	
10	13 V 96	J. M.	Sp.	M	33	Ab. alc. and tob. No syph.	R. 8 days.	Ac. retrob. neuritis. R. Fundus : Normal (cap. cong. of disk, dilat. ret. vs., indist. disk. margins). L. normal. R. $\frac{12}{200}$. L. $\frac{15}{15}$. Severe hdache., obst. hiccup, epigastric tenderness, dyspn. on exertion. Urine normal. 16 V 96 R. Mov. of hds. 18 V 96 R. o. : L. Pupil sluggish ; V. $\frac{10}{200}$. 20 V 96 L. $\frac{8}{200}$. 22 V 96 L. o. : 5 VI 96 P. L. outer pt. V. F. (R). 15 VI 96 R. Cts. fingers exc. L. Mov. hds. exc.	Blisters to temple. K. I. Strych. Phenacetine 16 V 96 Hg. 3 VI 96 Pilocarpine		

								23 VI 96 Relapse from exposure. Disks pale R. Mov. hds. L. o. 28 VI 96 R.: P. L. exc. L: Mov. hds. ex. 13 VIII 96 Impr. till relapse 2 days ago. Ophth.: Atr. O. N. V: Mov. hds.			
11	1 VI 96	E. F.	C.	M	31	Ab. tob.	10 months.	Chr. retrob. neuritis. Fundi: Normal. O. U. $\frac{15}{70}$. R. Centr. scot. gr.-blue. L. Centr. scot. gr.	Abst. K. I. Strych.		
12	31 VIII 96	L. L.	W.	M	50	Ab. alc. (formerly).		Part. atr. O. N. V. O. U.: $\frac{15}{80}$.			Pat. came for treatment f. double cataract. After extr. & disc. (both) w. perf. result, clear media, lesion discovered.
13	14 X 96	F. G.	W.	M	53	Ab. tob. and alc. Syph. sev. yrs. prev.	6 months.	Opt. neuritis. R. Indist. margins disk; V: $\frac{8}{200}$. L. Remains oid iritis mod. intense neuritis. 17 IV 99 Relapse.	Mixed treatm. 19 VII 99 Abst. K. I. Strych.	17 IV 99 Relapse. 19 VII 99 R. $\frac{4}{200}$.	
14	13 XI 96	J. M. H.	W.	M	48	Ab. tob. and coffee. No alc. rheum. or syph.	2 months.	Chr. retrob. neuritis. Grad. loss of S. O. U. Slight pallor O. N. V: $\frac{15}{200}$ Centr. scot. for red. No percept. of green. No pat. reflex, slight Romberg. Pup. reaction normal.	Abst. K.I. Strych.	19 XII 96 R. $\frac{15}{100}$. L. $\frac{15}{200}$.	

NO.	DATE.	INITIALS.	RACE.	SEX.	AGE.	ETIOLOGICAL FACTORS.	PREVIOUS DURATION.	FORM OF AFFECTION. PROMINENT SYMPTOMS.	TREATMENT.	RESULT.	OBSERVATIONS.
15	17 XI 96	R. R.	W.	M	39	Ab. alc. and tob. Works in tob.	3 months.	Chr. retrob. neuritis. Grad. loss of S. Pallor of temp. quadr. R. $\frac{15}{200}$. L. $\frac{15}{100}$. R. Centr. scot. gr. relat. sc. red. L. Relat. sc. for cols.	Abst. K. I. Strych.		
16	1 I 97	V. M.	Sp.	M	25	Ab. tob. 5–6 cigars. No alc. Syph. 1 yr. ago.	20 days.	Ac. retrob. neuritis. More or less rapid loss of S. Fundi: Normal. R. $\frac{6}{200}$. L. $\frac{10}{200}$. Scot. red and green.	Abst. K. I. Strych.		
17	20 II 97	J. I.	W.	M	28	Ab. alc. and tob.	4 months.	Chr. retrob. neuritis. Strab. converg. (L) (old) amblyopic. Grad. dim. of S. (R) Slight pap. congest. R. $\frac{18}{100}$. L. $\frac{4}{200}$ ambl.	Abst. K. I. Strych.	8 III 97 R. $\frac{15}{50}$.	
18	1 III 97	J. A.	W.	M	34	Ab. alc. and tob. No syph.	15 years.	O. N. Atrophy. Grad. failure of sight, O. N. atr. (gray) V: Mov. hd. Argyll-Robertson pup. No pat. reflex.	Abst. K. I. Strych.	16 III 97 V: $\frac{10}{200}$.	?
19	23 III 97	J. M.	W.	M	44	Ab. alc. and tob. Syph. 20 years ago.	4 months.	Chr. retrob. neuritis. Grad. dim. of S. (more marked last 5 days). Pallor of temp. quadr. of O. N. R. $\frac{10}{200}$. L. $\frac{12}{200}$. Relat. cent. scot. for red and green.	Abst. K. I. Strych. Pilocarp.	5 VII 97 V: $\frac{15}{200}$.	
20	28 III 97	L. C.	W.	M	27	Works in tobacco. (Does not smoke.)	20 days.	Ac. retrob. neuritis (R). Dimness of S. (R) last 20 ds. R. Margins of disk hazy. V: $\frac{15}{15}$. L. $\frac{15}{15}$. Urine: No alb., no sugar.	Rest. K. I. Nux. vom.	4 IV 97 R. $\frac{15}{50}$.	
21	10 V 97	J. M.	W.	M	62	Ab. alc. and tob.		Chr. retrob. neuritis. Pallor of temp. quadr. of O. N. V: $\frac{15}{15}$.	Abst. K. I. Strychnine.		

22	2 VI 97	J. F.	W.	M	35	Ab. alc. and tob.	6 months.	Chr. retrob. neuritis. Grad. failure of S. Atrophy of temp. quadr. V : $\frac{5}{200}$. no col. percept.	Abst. K. I. Strych.		
23	4 VI 97	A. P.	Sp.	M	34	Ab. alc. and tob. Syphilis. Malaria. Campaigning 2 years.	2 months.	Chr. retrob. neuritis. Grad. failure of S. Partial atr. O. N. (Temp. quadr.) R. $\frac{15}{70}$. C. scot. f. red and green. L. $\frac{15}{100}$. Relat. c. scot. f. green.	Abst. Strych.		
24	23 VIII 97	V. M.	W.	M	42	Ab. tob. No alc. No syph.	3 weeks.	Ac. retrob. neuritis. S. failing last 3 wks. Fundi : Normal. R. $\frac{15}{70}$. L. $\frac{15}{100}$. V. F. Normal. Col. percpt. normal.	Abst. K. I. Strych.	29 IX 97 The same.	
25	15 IX 97	B. D.	C.	M	39	Ab. tob. Mod. ab. alc. Exposure (?)	1 month.	Ac. retrob. neuritis. More or less sudden dim. of S. Slight haziness of disk margins. R. $\frac{15}{200}$. L. $\frac{15}{200}$. O. U. Relat. c. scot. for green.	Abst. K. I. Na. salicyl.	2 III 98 V : $\frac{15}{15}$.	
26	17 IX 97	J. V.	W.	M	24	Ab. alc. No ab. tob. No syph.	5 years.	Chr. retrob. neuritis. Grad. failure of S. R. $\frac{15}{20}$. L. $\frac{15}{20}$. V. F. Normal. Col. percept. poor.	Abst. mixed treatment. Strych.		
27	2 X 97	A. G. F.	W.	M	41	Ab. alc. and tob.	Some time.	Chr. retrob. neuritis. Grad. failure of S. Fundi : Normal. R. $\frac{15}{15}$. L. $\frac{15}{15}$.	Abst. K. I. Strych.	26 XI 97 R. $\frac{15}{15}$. L. $\frac{15}{15}$.	
28	13 X 97	A. G.	W.	M	29	Ab. tob. No syph.		O. N. atrophy. Grad. failure of S. O. N. atrophy. V : $\frac{6}{200}$.	Abst. K. I. Strych.	23 III 98 V : $\frac{6}{200}$.	?

NO.	DATE.	INITIALS.	RACE.	SEX.	AGE.	ETIOLOGICAL FACTORS.	PREVIOUS DURATION.	FORM OF AFFECTION. PROMINENT SYMPTOMS.	TREATMENT.	RESULT.	OBSERVATIONS.
29	10 XI 97	Dr. C.	C.	M	30	Ab. alc. Exposure. Malnutrit. (Sp. mil. Phys.)	3 weeks.	Ac. retrob. neuritis. Sudden failure of S. Fundi: Normal. R. $\frac{15}{40}$. L. $\frac{15}{100}$. C. scot. f. red and green.	Abst. K. I. Strych.	1 yr. later Totally rec.	
30	11 XI 97	D. B.	Fr.	M	45	Ab. alc. and tob. Sunstroke 3 yrs. ago.	3 months.	Chr. retrob. neuritis. Dim. of S. after sunstroke. Atr. of temp. quadr. V: $\frac{15}{200}$. No pat. reflex. Slight Romberg. Pup. react. normal.	Abst. K. I. Strych.	19 III 98 V: $\frac{15}{50}$.	
31	26 XI 97	J. B.	C.	M	43	Denies alc. (?) and tob. Syph. 10 years ago.	2 years.	Partial atr. O. N. Grad. failure of S. R. $\frac{15}{200}$. L. $\frac{3}{200}$. R. C. scot. f. red and green. L. Absol. c. scot.	Abst. K. I. Strych.		
32	29 XI 97	B. P.	W.	M	34	Smokes. No syph.	15 days.	Ac. opt. neuritis. Failure of S. R. Haziness of disk margins. L. Distinct opt. neurit. V: $\frac{12}{200}$. C. scot. f. gr.	Abst. Mixed treatment. Strych.		
33	4 XII 97	M. A.	M.	M	48	Ab. tob. No. alc. No syph.	Sev. mos.	Chr. retrob. neuritis. Grad. failure of S. Disks pale. R. $\frac{15}{200}$. L. $\frac{15}{200}$.	Abst. K. I. Strych.		
34	12 XII 97	A. B.	W.	M	61	Ab. alc. and tob.	1 month.	Ac. retrob. neuritis. More or less sudden failure of S. R. $\frac{15}{200}$. L. $\frac{15}{200}$. R. Relat. c. scot. f. red and green. L. C. scot. f. green. Relat. c. scot. f. red.	Abst. K. I. Strych.		
35	14 XII 97	J. P. S.	Sp.	M	34	Ab. alc. and tob. Expos'e to cold. No syph.	1 month.	Ac. retrob. neuritis More or less sudden failure of S. Pallor of temp. quadr. R. $\frac{15}{50}$. L. $\frac{15}{100}$. C. scot. f. green. Relat. c. scot. f. red.	Abst. K. I. Strych.	19 II 98 R. $\frac{15}{50}$. L. $\frac{15}{40}$.	

36	18 XII 97	S. G.	Sp.	M	47	Ab. alc. and tob.	2 months.	Ac. retrob. neuritis. More or less rapid failure of S. Pallor of temp. quadr. V: $\frac{15}{200}$. No percept. of green.	Abst. K. I. Strych.	15 I 98 V: $\frac{15}{15}$.	
37	3 I 98	T. M.	W.	M	56	Denies alc. and tob. ab. (?) No syph.	2 months. (?)	Chr. retrob. neuritis. Grad. failure of S. Atrophy of temp. quadr. V: $\frac{8}{200}$. R. C. scot. f. red and gr. L. Absol. c. scot.	Abst. K. I. Strych.		
38	3 I 98	V. A.	Sp.	M	35	Ab. alc. and tob.	3 months.	Chr. retrob. neuritis. Grad. failure of S. Pallor of temp. quadr. V: $\frac{15}{200}$. C. scot. f. red and green.	Abst. K. I. Strych.		
39	8 I 98	G. D.	W.	M	42	Ab. alc. and tob.	3 months.	Chr. retrob. neuritis. Grad. failure of S. Atrophy of temp. quadr. R. $\frac{10}{200}$. L. $\frac{18}{200}$. C. scot. f. red and green.	Abst. K. I. Strych.		
40	18 I 98	B. C.	N.	M	60	Ab. alc. and tob.		Chr. retrob. neuritis. Disks pale. V: $\frac{8}{200}$.	Abst. K. I. Strych.	4 II 98 V: $\frac{12}{200}$.	
41	8 II 98	C. A.	W.	M	42	Smokes cigars. No alc.	3 months.	Chr. retrob. neuritis. Grad. failure of S. Fundi: Normal. V: $\frac{15}{70}$.	Abst. K. I. Strych.	15 III 98 V: $\frac{15}{40}$.	
42	21 II 98	F. G.	Sp.	M	51	Ab. tob.		Chr. retrob. neuritis. Fundi: Normal. R. $\frac{15}{30}$. L $\frac{15}{40}$. Relat. c. scot. f. red and green.	Abst. K. I. Strych.	7 III 98 R. $\frac{15}{30}$. L. $\frac{15}{40}$.	
43	28 II 98	J. M.	W.	M	33	Ab. tob. and alc.	3 weeks.	Ac. retrob. neuritis. Failure of S. Fundi: Normal. R. $\frac{15}{200}$. L. $\frac{15}{60}$. C. scot. f. red and green.	Abst. K. I. Strych.	14 III 98 R. $\frac{15}{60}$. L. $\frac{15}{80}$.	
44	2 III 98	M. F.	W.	M	60	Ab. tob. Denies alc.	6 months.	Chr. retrob. neuritis. Grad. failure of S. Pallor of temp. quadr. R. $\frac{15}{50}$ c. scot. f. red and green. L. $\frac{15}{50}$.	Abst. K. I. Strych.		

NO.	DATE.	INITIALS.	RACE.	SEX.	AGE.	ETIOLOGICAL FACTORS.	PREVIOUS DURATION.	FORM OF AFFECTION. PROMINENT SYMPTOMS.	TREATMENT.	RESULT.	OBSERVATIONS.
45	2 III 98	A. P.	C.	M	37	Ab. tob. and alc.	8 days.	Ac. retrob. neuritis. More or less sudden failure of S. R. Fundus: Normal. V: $\frac{15}{10}$. Relat. c. scot. f. red and green. L. Scl. chor. post. V: $\frac{1}{200}$.	Abst. K. I. Strych.		S. (L) always poor.
46	4 III 98	A. R.	N.	M	30	Ab. tob. and alc.	4 months.	Chr. retrob. neuritis. Grad. failure of S. Margin of disk indist. V: $\frac{15}{200}$. C. scot. f. red and green.	Abst. K. I. Strych.		
47	5 III 98	J. L.	W.	M	42	Ab. tob. and alc.	1 year.	Chr. retrob. neuritis. Grad. failure of S. Slight indist. of disk margins. V: $\frac{10}{200}$. No percept. of red or green.	Abst. K. I. Strych.		
48	10 III 98	A. R.	W.	M	35	Ab. tob. and alc.		Partial atr. of O. N. (Temp. quadr.) R. $\frac{8}{200}$. L. $\frac{12}{200}$. C. scot. for red and green.	Abst. K. I. Strych.		
49	12 III 98	C. M.	N.	M	35	Ab. tob.	3 months.	Chr. retrob. neuritis. Grad. failure of S. Fundi: Normal. V: $\frac{15}{200}$.	Abst. K. I. Strych.		
50	26 III 98	L. M.	Sp.	M	32	Ab. tob. and alc.		Partial atr. of O. N. (Temp. quadr.) R. $\frac{15}{10}$. L. $\frac{15}{10}$. C. scot. for red and green.	Abst. K. I. Strych.		
51	18 IV 98	A. C.	W.	M	54	Ab. tob. and alc.		Ac. retrob. neuritis. V: $\frac{15}{200}$.	Abst. K. I. Strych.	17 VI 98 R. $\frac{15}{12}$. L. $\frac{15}{20}$.	
52	25 IV 98	M. L.	W.	M	38	Ab. tob. and alc.	2 months.	Chr. retrob. neuritis. Grad. failure of S. V: $\frac{15}{200}$.	Abst. K. I. Strych.		
53	4 VII 98	B. M.	C.	M	29	Ab. tob. and alc.	3 months.	Ac. retrob. neuritis. Rapid failure of S. Pallor of temp. quadr. V: $\frac{10}{200}$. C. scot. for red and green.	Abst. K. I. Strych.		
54	8 VII 98	J. C. C.	C.	M	55	Ab. alc. and tob.		Chr. retrob. neuritis. Pallor of temp. quadr. V: $\frac{6}{200}$.	Abst. K. I. Strych.	3 X 98 V. $\frac{15}{10}$.	

55	19 VIII 98	F. V.	W.	M	56	Ab. tob.	5 years.	Chr. retrob. neuritis. Grad. failure of S. Pallor of temp. quadr. R. $\frac{15}{70}$. L. $\frac{15}{100}$. Relat. c. scot. f. green.	Abst. K. I. Strych.	3 XI 98 R. $\frac{15}{15}$. L. $\frac{15}{15}$.	
56	5 IX 98	A. F.	W.	M	61	Ab. tob.	1 year.	Chr. retrob. neuritis. Grad. failure of S. Pallor of temp. quadr. R. $\frac{15}{100}$. L. $\frac{15}{200}$.	Abst. K. I. Strych.	8 X 98 R. $\frac{15}{15}$. L. $\frac{15}{100}$. O. U. $\frac{15}{50}$.	
57	24 IX 98	J. C.	W.	M	37	Ab. alc. and tob.		Partial atr. of O. N. V: $\frac{8}{200}$.	Abst. K. I. Strych.		
58	1 X 98	M. S.	W.	M	58	Ab. alc. and tob.		Chr. retrob. neuritis. V: $\frac{15}{200}$. Relat. c. scot. for red and green.	Abst. K. I. Strych.	10 X 98 V: $\frac{15}{200}$.	
59	3 X 98	F. C.	N.	M	44	Ab. alc. and tob.		Chr. retrob. neuritis. V: $\frac{15}{200}$.	Abst. K. I. Strych.		
60	9 X 98	L. A.	W.	M	62	Ab. tob. Denies ab. alc. (?)	6 months.	Chr. retrob. neuritis. Grad. failure of S. R. $\frac{10}{200}$. L. $\frac{15}{200}$. C. scot. f. red and green. No pat. reflex or cramps in legs.	Abst. K. I. Strych.	26 XI 98 R. $\frac{15}{200}$. L. $\frac{15}{100}$.	
61	11 X 98	J. P.	Sp.	M	43	Ab. alc. and tob. Hunger. Exposure.	4 months.	Chr. retrob. neuritis. Atr. of temp. quadr. V: $\frac{15}{200}$. Relat. c. scot. for red and green.	Abst. K. I. Strych.		
62	13 X 98	E. F.	W.	M	60	Ab. tob.	Few mos.	Chr. retrob. neuritis. S. failing. Temp. quadr. pale.	Abst. K. I. Strych.	9 XI 88 The same.	
63	15 X 98	C. B.	N.	M	53	Ab. tob.	8 months.	Chr. retrob. neuritis (?) Failure of S. V: $\frac{8}{200}$.	Abst. K. I. Strych.	27 XI 98 V: $\frac{15}{200}$.	
64	20 X 98	M. P.	Sp.	M	38	Ab. alc. and tob. Syphilis.	1½ years.	Partial atr. of O. N. R. $\frac{15}{200}$. C. scot. for red and green. L. $\frac{15}{200}$. Relat. c. scot. for green. No pat. reflex; ataxic gait; pains in legs. Pupils: Myotic, sluggish.	Abst. douches. K. I. Strych.		

NO.	DATE.	INITIALS.	RACE.	SEX.	AGE.	ETIOLOGICAL FACTORS.	PREVIOUS DURATION.	FORM OF AFFECTION. PROMINENT SYMPTOMS.	TREATMENT.	RESULT.	OBSERVATIONS.
65	26 X 98	J. R.	W.	M	59	Ab alc. and tob.	20 days.	Ac. retrob. neuritis. More or less rapid failure of S. Fundi: Normal. R. $\frac{15}{60}$. L. $\frac{15}{40}$. No percept. of cols. (congenital).	Abst. K. I. Strych.		?
66	3 I 99	S. P.	Sp.	M	36	Ab. alc. and tob.	3 months.	Chr. retrob. neuritis. Grad. failure of S. Margins of disk indist. V: $\frac{15}{200}$. Relat. c. scot. for red and green.	Abst. K. I. Strych.	20 IV 99 V: $\frac{15}{60}$.	
67	14 II 99	F. R.	W.	M	39	Ab. tob. Tob. worker. Fevers. (Quinine.)	1 year.	Chr. retrob. neuritis. S. failing since fevers. Fundi: Normal. Arts. narrow. R. $\frac{15}{60}$. L. $\frac{15}{100}$. Col. percept. normal. Xanthopsia.	Abst. K. I. Strych.		
68	22 III 99	P. V.	W.	M	60	Ab. tob.		O. N. atrophy. R. $\frac{15}{100}$. L. $\frac{15}{200}$.	Abst. K. I. Strych.		
69	7 IV 99	P. O.	W.	M	54	Ab. tob. and alc.	3 months.	Ac. retrob. neuritis. More or less sudden failure of S. R. $\frac{15}{40}$. L. $\frac{15}{60}$. Col. percept. good.	Abst. K. I. Strych.		?
70	25 IV 99	C. P.	W.	F	32	Ab. tob. Malnutrit (blockade). Hges. fr. gen. organs.	8 months.	Partial atr. O. N. R. $\frac{15}{200}$. Col. percept. normal. L. $\frac{15}{100}$. Relat. c. scot. for red and green.	Abst. K. I. Strych.		
71	26 V 99	G. G.	Sp.	M	43	Ab. tob. and alc.	2 months.	Chr. retrob. neuritis (?). Grad. failure of S. Pallor of temp. quadr. V: $\frac{15}{70}$. Argyll-Robertson pupil. Pat. reflex. dim.; pns. in legs. No Romberg.	Abst. K. I. Strych.	1 VIII 99 R. $\frac{15}{40}$. L. lost thro' injury.	
72	24 VI 99	P. L.	Sp.	M	44	Ab. alc. and tob.	1 year.	Chr. retrob. neuritis. Grad. failure of S. Pallor of temp. quadr. R. $\frac{15}{100}$. L. $\frac{15}{200}$. No percept. of green.	Abst. K. I. Strych.		

								R. $\frac{1}{200}$. L. $\frac{1}{200}$. No percept. of green.			
73	10 VII 99	H. C.	N.	M	56	Ab. alc. and tob. Exposure (Cuban Army.)	R. 2 yrs. L. $\frac{1}{2}$ yr.	Chr. retrob. neuritis. R. When 1st affected p'nful, congested (iritis); pupil narrow; adh. Tn. No details of fundus. V: mov. hds. L. Mydriasis: O. N. white. V. $\frac{4}{200}$. No pat. reflex.	Abst. K. I. Strych. Atrop. (R.)	22 VII 99 L. $\frac{6}{200}$. 3 VIII 99 L. $\frac{15}{70}$.	
74	11 VIII 99	V. N.	M.	M	29	Ab. alc. Fevers. (War.) Wd. in head.	8 months.	Chr. retrob. neuritis. Failure of S. after fevers. Pallor of temp. quadr. V: $\frac{15}{200}$. V. F. normal. Col. percept. normal.	Abst. K. I. Strych.		?
75	17 VIII 99	M. B.	Sp.	M	22	Ab. tob. No alc. No syph.	4 months.	Ac. retrob. neuritis. Failure of S. (Sudden.) Partial atr. O. N. R. $\frac{15}{200}$. L. $\frac{6}{200}$. C. scot. for green.	Abst. K. I. Strych.		
76	26 VIII 99	C. G.	N.	M	29	Ab. tob. and alc. Fevers. (Quinine.)	4 months.	Chr. retrob. neuritis. Amblyopia. Fundi: Normal. R. $\frac{6}{200}$. L. $\frac{8}{200}$. Col. percept. normal.	Abst. K. I. Strych.		
77	31 VIII 99	F. L.	Sp.	M	30	Ab. tob. and alc. Syphilis.	1 month.	Ac. retrob. neuritis. Pallor of temp. quadr. R. $\frac{15}{100}$. L. $\frac{15}{70}$. No percept. of green.	Abst. K. I. Strych.		
78	28 X 99	B. J.	Sp.	M	33	Ab. tob. No alc. (?) No syph. Seaman.	20 days.	Ac. retrob. neuritis. R. $\frac{12}{200}$. L. $\frac{8}{200}$.	Abst. K. I. Strych.		
79	8 I 1900	A. F.	F.	M	39	Ab. alc. and tob.		Chr. retrob. neuritis. V: $\frac{15}{100}$. Relat. c. scot. f. red and green.	Abst. K. I. Strych.	12 VI 00 The same.	

NO.	DATE.	INITIALS.	RACE.	SEX.	AGE.	ETIOLOGICAL FACTORS.	PREVIOUS DURATION.	FORM OF AFFECTION. PROMINENT SYMPTOMS.	TREATMENT.	RESULT.	OBSERVATIONS.
80	10 I 00	R. A.	C.	M	49	Ab. alc. and tob.		Chr. retrob. neuritis. Grad. failure of S. Fundi: Normal. V: $\frac{15}{200}$. C. scot. f. red and green.	Abst. K. I. Strych.		
81	14 II 00	S. C.	Sp.	M	42	Ab. alc. and tob.	5 months.	Chr. retrob. neuritis. Grad. failure of S. Slight pallor of disks. R. $\frac{15}{20}$. L. $\frac{15}{20}$. Green seen blue. L. relat. c. scot. f. red.	Abst. K. I. Strych.		
82	19 II 00	J. F.	Sp.	M	39	Ab. alc. and tob.	8 months.	Chr. retrob. neuritis. Pallor of temp. quadr. V: $\frac{15}{20}$.	Abst. K. I. Strych.	28 II 00 V: $\frac{15}{20}$. 10 V 00 V: $\frac{15}{20}$.	
83	27 II 00	T. M.	Sp.	M	32	Ab. alc. and tob.	1 month.	Ac. retrob. neuritis. R. Pallor of temp. quadr. V: $\frac{15}{20}$. No percept. of green.	Abst. K. I. Strych.	6 VIII 00 V: $\frac{15}{20}$.	L. E. lost 11 yrs. ago.
84	28 II 00	B. A. A.	C.	F	30	Ab. tob.	10months.	Chr. retrob. neuritis. Pallor of temp. quadr. V: $\frac{15}{100}$. V. F. normal. Col. percept. normal.	Abst. K. I. Strych.	6 VIII 00 V: $\frac{15}{20}$.	
85	20 III 00	F. G.	W.	M	42	Ab. tob. No alc. No syph.	2 years.	Chr. retrob. neuritis. Pallor of temp. quadr. R. $\frac{18}{200}$. L. $\frac{19}{200}$. Relat. c. scot. f. red.	Abst. K. I. Strych.	19 IV 00 R. $\frac{15}{100}$. L. $\frac{15}{100}$.	
86	20 IV 00	E. B. D.	Am.	M	47	Denies (?) alc. and tob. Chancre 30 yrs. ago.		Partial atrophy O. N. R. $\frac{15}{200}$. No. red. C. scot. f. green. L. $\frac{15}{70}$. No green.	Abst. K. I. Strych.	6 VI 00 R. $\frac{15}{200}$. L. $\frac{15}{70}$.	
87	7 V 00	I. B.	Sp.	M	48	Ab. alc. and tob. Works in distillery.	15 days.	Ac. retrob. neuritis. More or less sudden failure of S. Pallor of temp. quad. R. $\frac{15}{70}$. L. $\frac{15}{100}$. Relat. c. scot. f. red and green.	Abst. K. I. Strych.	29 V 00 R. $\frac{15}{20}$. L. $\frac{15}{20}$.	

88	29 V 00	J. J.	Sp.	M	30	Ab. alc. and tob. Chancre 6 years ago.	10 years.	Partial atrophy O. N. R. $\frac{5}{200}$. L. $\frac{1}{200}$. C. scot. f. green. Pup. reflex normal. Pat. reflex, dim.	Abst. K. I. Strych.		
89	19 VIII 00	F. F.	Sp.	M	31	Ab. tob.	Sev. yrs.	Partial atrophy O. N. R. $\frac{15}{200}$. L. $\frac{15}{100}$. Relat. c. scot. f. red and green.	Abst. K. I. Strych.		
90	17 IX 00	M. R.	C.	M	24	Ab. tob.	3 years.	Partial atrophy O. N. V: $\frac{15}{200}$. Relat. c. scot. f. red and green.	Abst. K. I. Strych.	10 X 00 The same.	
91	11 IX 00	C. L.	M.	M	44	Ab. tob. (8–12 cigars.) Loss of bl. (hemorrh.)	1 month.	Ac. retrob. neuritis. Fundi: Normal. R. $\frac{15}{200}$. L. $\frac{15}{200}$. Some contract. of V. F. Col. percept. normal. Reflexes normal.	Abst. K. I. Strych.	26 X 00 R. $\frac{15}{200}$. L. $\frac{15}{200}$.	
92	21 IX 00	G. D.	Am.	M	50	Ab. alc. and tob.	Sev. yrs.	Partial atrophy. O. N. Absolute c. scot.			Pt. died fr. chr. alc. Autopsy: Plastic meningitis. (Eyes, nerves, and chiasm preserved for future exam.)

ANGIOSARCOMA OF CHOROID. FOUR YEARS' OBSERVATION.

By Dr. KASPAR PISCHEL, San Francisco, Cal.

E. J., forty-seven years old, came to me four years ago complaining that with left eye objects in lower half looked yellow; this he had observed for the last ten days.

I found: R. eye: cyl. + 0.5 ax. horiz. $\frac{5}{5}$; after homatr. same. L. eye; — 1.5 $\frac{5}{12}$, dial equal; field normal; fundus normal.

Nine months later, sight in left eye had decreased to $\frac{5}{15}$; with glasses no improvement. In region of macula a few yellow spots.

Three years later, sight had increased to: cyl. — 0.5 vert. < $\frac{5}{5}$, but field was not normal any more, it showed a decided narrowing to 15° from above and below. Patient complained of not being able to see in certain directions with left eye. Tension was the same as in right eye. Under homatropia, I found in outer-upper part of fundus a vascular cone-shaped tumor, the top of which reached about 3 *mm* into vitreous.

Diagnosis.—Sarcoma of the choroid. I told patient that I considered it necessary to remove the eye, and suggested to have a consultation. Both were refused by the patient.

After this, patient stayed away for nearly nine months, when he came again at my request. I found a total funnel-shaped detachment of the retina; tumor increased, plainly visible by direct examination. Even now I could not induce patient to have a consultation or to submit to enucleation.

Another two and a half months went by when patient came to me (almost exactly four years after his first visit) complaining about severe pain in and around left eye, which he said had been inflamed for the last four days.

I found: eye injected; no chamber; pupil 5½ *mm*, no reaction; iris full of small hemorrhages; tension high; no perception of light.

Next day: enucleation. At the opening of the eyeball, which was under high tension, red fluid spurted out. Superficial examination showed a dark tumor of the size of a large cherry and total detachment.

Dr. Philip King Brown made the microscopical examination and reported: Plexiform spindle-celled infiltration surrounding partially necrotic areas, which are permeated with extensive hemorrhages and moderate brownish pigmentations resulting from disintegration of red corpuscles in hemorrhages.

AN ARTERIO-VENOUS ANEURISM OF THE RETINA.

By Dr. SEYDEL,

ASSISTANT TO THE UNIVERSITY EYE CLINIC IN BRESLAU.

(*With a colored drawing on Plate VI. of Vol. XXXVIII., Ger. Ed.*)

Translated by Dr. WARD A. HOLDEN.

CONGENITAL vascular anomalies of the retina have been frequently enough reported, but in the majority of cases the anomalies were venous, consisting in abnormal tortuousness and unusual communicating branches between two different vascular areas. The venous system in general is not so regular in arrangement as the arterial and hence variations in it are more frequent. Stephenson[1] estimates these anomalies to be present in 3% of all eyes examined.

I am now able to offer a remarkable and unusual contribution to the congenital anomalies of the vessels in the form of an arterio-venous aneurism of the retina. This vascular anomaly was discovered by accident in a healthy clerk of eighteen, who came to the clinic complaining of weakness of vision in his right eye.

Excepting measles he had had no illnesses in youth, and could not remember having had any injury whatever to the left eye.

Examination showed

R: Hyperopic astigmatism of $2-3$. D, axis oblique; with correction $V = \frac{6}{15}$.

L: $V = \frac{6}{9}$, improved by $+2.5$. The media were clear, the

[1] "Congenital Anomalies of the Retinal Veins." *Lancet*, I., p. 249.

pupillary reaction was prompt, and the field of vision was normal.

The patient's general condition, particularly as regards the circulatory apparatus, was normal.

Ophthalmoscopic Examination of the Left Eye.

The fundus was normal with the exception of a very marked anomaly of the upper temporal vessels. On the disc, near together, lie two vessels, the nasal one having 4–5 times its usual diameter, a dark color, and a dull reflex, while the temporal one is somewhat smaller, lighter, and has a brighter reflex. (Plate VI.) The first vessel twists about in meandering curves, first upward, then temporally after crossing the second vessel, and then downward. It then abruptly enters the other vessel after having crossed it again. The color of the vessel becomes brighter, until just before it enters the other it has practically the color of the other (which is not clearly enough indicated in the drawing). The second vessel, lying to the temporal side, shows at first several aneurismal dilatations and narrowings of its lumen, then runs upward more directly to become tortuous again in its lateral course. In one of these windings it crosses the first vessel, which here enters it; it then becomes narrower and divides into two small branches, one of which runs temporally and the other downward. The lower branch winds about a horizontal vessel, forms a convolution, and then enters this vessel.

From the first main trunk one venous twig is given off to the nasal side at its first bend, and another to the temporal side at its third bend. A twig from the horizontal portion is not distinctly either venous or arterial. Just as the trunk bends a large vessel enters it at right angles. This vessel is composed of several branches having a most tortuous course, and it appears to be arterial.

The second main trunk gives off some small arterial branches and the large temporal branch which receives the vessel proceeding from the convolution mentioned above. It also presents all the characteristics of an artery.

It has seemed to me advisable to give special attention to the minor branches since these give us the best evidence in judging of the nature of the two main trunks, and, all things considered, there can be no doubt but that the nasal trunk is the superior central vein, and the temporal trunk the superior temporal artery.

According to the pathological nomenclature, I believe that our vascular anomaly must be called a varix aneurysmaticus. According to Ziegler, when a new-formed blood sac furnishes a communication between an artery and a vein a varicose aneurism is formed, but when the blood from an artery is forced directly into a vein which yields from the pressure of the arterial blood an aneurismal varix follows.

The latter description fits this case, while Fuchs's[1] case, which arose from a trauma, was an example of the former.

The arterial blood here passes without any weakening of its force directly into the original vein, and it is not a cause for wonder therefore that the vein has become so tortuous and distended. The unweakened force of the blood current explains also the enormous tortuousness of the smaller venous branches, and particularly of that branch which gives rise to a tangle of vascular loops. This branch, designed to carry back the venous blood from the capillaries to the heart, now doubtless carries arterial blood centrifugally to the capillaries.

Through such abnormal hæmodynamic relations I am inclined to explain not only directly the monstrosity of the course of this branch, but also indirectly, through its reaction, the dilatation and tortuousness of the primary artery. There would seem to be no other explanation of the condition.

The original vein takes on a darker color the nearer it approaches the disc, because here the venous blood has not been mixed with that from the communicating branches.

In this case the color of the two main vessels differed perceptibly at the disc, as the drawing shows, but in Magnus's ("Aneurysma arterio-venosum retinale," *Virchow's Archiv*, lx., pp. 38–45) case, which much resembled mine, and in Fuchs's case, the color of the two was identical. Magnus's explanation, that the cause of this was a direct mingling of the venous with the arterial blood, is not in accordance with the laws of hæmodynamics, as Leber (*Graefe-Saemisch*, v., p. 526) and Fuchs have already pointed out.

[1] Fuchs, "Aneurysma arterio-venosum retinale." *Arch. f. Augenheilk.*, xi., p. 440.

The unusual anastomosis of the terminal arterial branch and the lateral arterial branch running temporally is doubtless due to the increased blood pressure in the artery, and perhaps an original capillary anastomosis has dilated under the increased pressure into a visible artery. The convolvulus of vessels is to be explained in a similar way.

There is no doubt but that the development of this anomaly dates from the period of intrauterine life. The history, as well as the absence of pigmentary changes, of opacities of the media, and of functional disturbances, rules out trauma. Any mechanical hindrance to the circulation that would have produced the present condition gradually, must be excluded on account of the intact function of the retina and the absence of other disturbances in the circulatory apparatus.

The assumption of a congenital anomaly may be supported by the anomalous structure of the two eyes: R: astigmatism against the rule of 2.–3. D; L: hyperopia of 3.–4. D.

What was the actual cause of these malformations it is, of course, impossible to say.

Schleich[1] also believed that he had to do with a congenital anomaly in his very remarkable case, which presented, besides an aneurismal varix that resembled mine, other puzzling vascular communications and circumscribed aneurisms.

Magnus, whose case also resembled mine, referred the changes definitely to a trauma, yet it is difficult to understand how, after rupture of two main branches of the central artery of the retina and the consequent subretinal or vitreous hemorrhages, the secondary changes could have been, even years afterwards, so slight as they are represented in his drawing.

Besides the case of Fuchs, I may mention for the sake of completeness the cases collected by Leber,[2] viz., those of Graefe,[3] Schmiedler,[4] Scultet,[5] Sous,[6] and Mannhardt.[7]

[1] "Aneurysma arterio-venosum, Aneurysma circumscriptum et Varix retinæ." *Mitth. a. d. ophth. Klinik in Tübingen*, ii., 1, p. 202.

[2] *Graefe-Saemisch*, v., p. 526. [3] *Ibid.*

[4] Cited by Demoure, *Traité des maladies des yeux*, i., p. 108.

[5] *Diction. des sciences méd.*, xxxv., p. 20.

[6] "De l'anévrisme de l'artère centrale de la retina." *Ann. d'ocul.*, liii., p. 241.

[7] "Rupture of the Choroid." *Klin. Monatsbl. f. Augenheilk.*, xiii., p. 132.

Graefe found at the autopsy on a woman who had become blind with a feeling of pulsation in the orbit that the central artery in the axis of the optic nerve had undergone an aneurismal dilatation as large as a straw.

The observations of Schmiedler and Scultet were questioned by Leber.

Sous observed an aneurism of the central artery which had arisen spontaneously, and Mannhardt one that was due to injury, both being near the disc.

In conclusion, I wish to thank Prof. Uhthoff for permitting me to report this case, and for assisting me in describing it.

A CONTRIBUTION TO THE SYMPTOMATOLOGY AND HISTOLOGY OF PRIMARY MYXOSARCOMA OF THE OPTIC NERVE, AND TO THE OPERATIVE REMOVAL OF SUCH GROWTHS BY KRÖNLEIN'S METHOD.[1]

By Prof. TH. AXENFELD and Dr. FR. BUSCH.

(*With five illustrations on Plate I. of Vol. XXXIX., German Edition, 1899.*)

Abridged Translation by Dr. Ward A. Holden.

HISTORY OF THE PATIENT.

Jan. 6, 1898.—M. L., a girl of eleven, had suffered for a year and a half with headaches which occurred about once a week. The pain is in the forehead on both sides and extends over the vertex. At the time of the headaches the father had noticed a slight protrusion of the eye, and the attacks often were accompanied by chills, fever, and vomiting. The patient now complains of headache and pain in the right eye and temple. Temperature, 39° C.

The right eyeball evidently protrudes somewhat. R V = 0.7; with + 3. V = 1. Field of vision complete, ophthalmoscopically normal. L V = 1. Ocular movements normal. Good pupillary reaction. Urine normal.

Feb. 24th.—There has been varying increase in temperature and in the exophthalmus, with pain in the eye and vomiting. A general examination revealed nothing abnormal, and an examination of the nose, ears, and accessory sinuses was negative.

With the ophthalmoscope a beginning optic neuritis was discovered, and some increase in hyperopia, but with the correction V = 1.

[1] From the University Eye Clinic at Rostock.

Jan. 3d.—With best correction V = 0.8. The eyeball does not protrude farther when the patient bends forward. Beginning well-marked choked disc.

Jan. 5th.—Krönlein's operation was performed. A curved incision was made through the skin from the zygomatico-frontalis suture along the outer margin of the orbit out over the arch of the zygoma. The periosteum was divided along the outer orbital margin and separated from the bone, so that the entire contents of the orbit covered with periosteum was mobile. A triangular piece of bone was then separated with a chisel, and together with the skin and muscle turned outward with a blunt double hook so that the orbit lay exposed to its apex and two fingers could be inserted into it. The periosteum was split from before backwards; after pushing aside the fat and muscles, a smooth tumor as large as a walnut appeared, from which emerged the optic nerve, which was normal for 6 *mm* of its distal end. Posteriorly the tumor filled up the apex of the orbit, and was not movable in respect to the optic foramen. The tumor was freely exposed, and a suture passed round the normal portion of the nerve, which was then divided close to the sclera, and by traction on the thread the tumor was drawn forward and cut off close to the optic foramen.

The bone was replaced, three sutures were passed through the skin, and a tampon of iodoform gauze, inserted above, reached into the depth of the orbit. The course was favorable, and the dressings were left off on March 20th.

April 20th, the patient was discharged. The general condition had improved, and there had been no fever or vomiting.

Ptosis existed after the operation as before. The cornea is clear and lustrous. The ball is slightly movable outward, but not in any other direction. No exophthalmus. The fundus is of a light almost whitish color, the margins of the disc are blurred, and about the disc are small hemorrhages in the retina. The retinal arteries are scarcely visible, but the veins are better filled.

May 3d.—Mobility upward and downward is somewhat more extensive. Ptosis less marked. Cornea completely anæsthetic. Tension greatly reduced. Disc scarcely visible. Retina opaque and presenting many masses of pigment.

July 6th.—The width of the right palpebral aperture is two-thirds of the left. The eyeball has not decreased in size. Mobility downward and outward extensive, upward somewhat less, inward very slight. Sensibility in the lower-outer quadrant of the cornea has returned, elsewhere it is absent.

Jan. 15th. 1899.—The ptosis has almost disappeared. Mobility limited inward only, no strabismus. Eyeball of normal size, media clear, pupil smaller and reacting somewhat consensually. Ophthalmoscopically excessive chorio-retinal atrophy with marked pigmentation. Sensibility as before.

The nature of the exophthalmus and the unaltered mobility of the ball caused at once suspicion of tumor of the nerve, yet the periodic variation was unusual. This variation has hitherto been observed chiefly in cases of vascular tumors, such as varicose veins in the orbit or cavernous angiomata, which increase in size when the circulation is interfered with as in deep expiration, bending forward, or compression of the jugular. In some cases this may lead to hemorrhage. In our case, however, notwithstanding the spontaneous periodic variations, these could not be brought about by bending the patient forward or compressing the jugular vein.

In how far the variations of the exophthalmus depended upon the optic-nerve tumor, and whether perhaps an occasional inflammatory œdema caused circulatory changes in the orbit, cannot with certainty be said. It was noteworthy, however, that fever always accompanied the increased exophthalmus, and no cause could be found for it in the general condition.

Vision nearly normal in cases of primary optic-nerve tumor has been found hitherto but three times at the time of operation, excepting in those cases of endothelioma which proceed from the nerve sheath and often leave the nerve uninjured. The ophthalmoscopic appearance also was normal until twelve or fourteen days before the operation.

Recently Braunschweig, in particular, by employing Krönlein's method of temporary resection of the outer wall of the orbit has renewed the old endeavor to operate with preservation of the ball.

(The authors here give a résumé of the literature with tabular statistics, but since their paper was written the literature has increased to such an extent and the value of the operation has been so universally recognized that this portion of the paper will here be omitted.—*Trans.*)

PATHOLOGICAL.—The tumor is as large as a walnut and surrounds the optic nerve concentrically. The surface is smooth, the consistency soft and elastic, almost fluctuating.

The tumor began about 6 *mm* behind the eyeball, and this anterior portion of the optic nerve appears normal, while farther backward the substance of the nerve is thickened and of a reddish-gray color. In transverse section the nerve appears enlarged to about three times its natural size. The sheath is thickened also. At the bulbar end the intervaginal space is markedly widened and filled with grayish-red masses.

Microscopic Examination of Transverse Sections at Five Different Planes.

Near the ball the optic nerve is of normal form and normal diameter. On one side of the nerve is a crescentic broadening of the intervaginal space (Fig. 1, Pl. I.), containing darkly staining masses. Farther back the entire sheath is irregularly detached from the nerve, and the deposited mass has a breadth of 5 *mm*.

Farther back the nerve itself increases in thickness, and the boundary line between the infiltrated nerve and the tumor-masses in the intervaginal sheath becomes indistinct. About the middle of the tumor the pial sheath alone perceptibly separates the nerve laterally and below from the bulk of the tumor (Fig. 2). The nerve here is increased to about three times its normal diameter. A little farther backward the limits of the nerve can be more distinctly made out, but near the posterior pole of the tumor the nerve is still twice as thick as the normal (Fig. 3).

The intervaginal portion of the tumor is most marked upward. In general it may be said that between the anterior and middle thirds of the nerve its pial sheath is interrupted for about 5 *mm*, and here there is a direct connection between the growth in the nerve and that in the intervaginal space (Fig. 5).

The results of staining the medullary substance of the nerve by the Weigert-Pal method are of particular interest, because of the good vision at the time of operation. An-

teriorly no particular atrophy of the fibres can be made out, although there is some increase in the number of nuclei. After the nerve has entered the tumor the staining of the medullary sheaths in the centre of the nerve is less perfect, and between the fibre bundles nuclei increase in number until farther back in the nerve the fibres give place to vascular tumor masses. The peripheral fibres take the stain better, and they are recognizable even at the spot where the pial sheath is defective and the outer tumor passes over directly into the nerve. In the posterior portion of the nerve, the centre is taken up with a cylindrical tumor-mass, while in the periphery fibres retaining their medulla, although compressed, still are present.

Apparently the tumor began in or near the pial sheath at the point where the tumor is now thickest. The growth then spread in the intervaginal space and also into the nerve, forcing the bundles apart until it reached the axis, and thence extending forward and particularly backward, sparing the peripheric portion of the nerve.

Under the immersion lens the growth is seen to consist of cells of irregular form, many of them with processes, with a considerable amount of intercellular matter. There are also many free nuclei lying in an intercellular substance, partly homogeneous, partly fibrous and net-like, in which are many cavities.

The myxomatous substance is present most largely in the middle and older portions of the tumor, while anteriorly the growth consists rather of more closely packed cells. Here the tumor has propagated along the septa. In the middle of the tumor the intercellular substance here and there has assumed the character of hyaline cartilage with cartilage cells, a condition not rarely found in fibrosarcomas.

The noteworthy features of the case are:

1. The periodic variation of the exophthalmus, with accompanying fever.

2. The almost perfect acuteness of vision and complete field on the day of operation after the exophthalmus had lasted eight months and a considerable tumor of the nerve had developed.

3. The extirpation of the tumor by Krönlein's method with permanent preservation of the ball.

4. The extensive improvement of the paralysis of the ocular muscles after the operation.

5. The condition and distribution of the medullated fibres in the optic nerve.

6. The existence of hyaline cartilage in the nerve.

SYMBLEPHARON OPERATION ON THE DOUBLY EVERTED UPPER LID WITH THE SUTURING OF A TRANSPLANTED FLAP TO THE TENDINOUS EXPANSION OF THE SUPERIOR RECTUS MUSCLE, THUS FORMING A PERMANENT RETROTARSAL FOLD.

By Dr. HUGO WOLFF, Berlin.

Slightly Abridged Translation by Dr. Ward A. Holden.

THE formation of a retrotarsal fold that shall be permanent still seems to be the difficult point in all operations for symblepharon hitherto practised. The cause of this—in the usual operation in which the flap is pressed into the angle between the lid and eyeball by means of a suture passed simply through the skin (Snellen)—seems to lie in the lack of an actual fixed point to which the transplanted flap may heal.

In my anatomical studies in regard to the levator and to the *topography of the doubly everted upper lid*,[1] it occurred to me that the tendinous expansion of the superior rectus which lies just beneath the conjunctiva was the natural insertion of the upper conjunctival arch, and might serve as the desired fixed point of attachment for the new-formed upper retrotarsal fold. Only recently have I had the opportunity to give this operation a practical trial.

The history in so far as it is of interest here is as follows :

M. T., a girl of twenty, working in a chemical factory, was injured August 15, 1898, by a 40 % solution of nitrate of silver flying into her face. A neutralizing salt solution was at once

[1] *Arch. f. Augenheilk.*, xxxiii., p. 142.

employed. Six hours later, when I saw the patient, her condition was as follows: Face, neck, arms, and hands were covered with a black coating. The right eye was outwardly intact. On the left side the lids were considerably swollen, but could be opened. When gently drawn apart the palpebral conjunctiva was seen to be burned white in its nasal half, and the bulbar conjunctiva was greatly thickened and of porcelain-like whiteness. The cornea, however, had remained quite clear. Warm fomentations being made day and night, a faint general opacity of the cornea began and several broad tracts of blood-vessels ran to the corneal margin, and the bulbar conjunctiva had taken on a rosy hue. Six weeks later, the fomentations being continued and the lids frequently detached from the ball, the infero-temporal quadrant of the cornea was alone free, the remainder being covered with a traumatic pterygium and there being symblepharon of both lids. In the following six weeks no perceptible change having taken place, in November, three months after the injury, an operation was undertaken.

At this time the palpebral aperture was 4 *mm* high, and the eye could not be opened wider than this. The supero-nasal quadrant of the cornea exhibited a triangular adhesion to the upper lid, whose base directed upward measured 12 *mm*. At this spot there was a free area next the lid margin, about 3 *mm* broad. In the infero-nasal quadrant a symblepharon, half as large, extended perhaps 3 *mm* over the corneal margin. To the portion of the cornea lying between, the conjunctiva of the semilunar fold had become adherent, obliterating the adjacent portions of the retrotarsal folds.

November 15, 1898. Ether narcosis. After detaching the adhesion with the cornea by means of an iridectomy lance and an iris forceps, the upper adhesion was divided up to the retrotarsal fold with the scissors, so that the upper lid could be doubly everted. In this position the lid was temporarily attached to the skin of the lid by two sutures. Thus there was exposed a rectangular raw surface, of which the lower half belonged to the sclera, and the upper to the lid. Vertically this surface measured 2 *cm* and laterally 1.5 *cm*, in consequence of the extension caused by the eversion of the lid and the natural retraction of the elastic margins of the conjunctiva. The covering of a raw surface artifi-

cially enlarged in this way seemed to me to be of advantage on account of the shrinking which was to be expected later.

In grasping the raw surface of the lid with forceps, the pathologically thickened expansion of the rectus could be raised up. This lay with its free margin at the upper convex margin of the lid from which it had necessarily been separated when the conjunctiva was divided. Beneath it Müller's elevator muscle of the lid could be seen. The expansion of the rectus was now seized with two forceps at its free margin, stretched horizontally forward, and cut off with scissors up to the line where the upper retrotarsal fold should be. Thus a crescentic flap 1 *cm* deep and 1.5 *cm* broad was removed. In future cases I shall omit this excision, and only make a horizontal incision in the muscle at the proper point for suturing the upper margin of the covering flap.

The defect of the upper lid and sclera was covered with two flaps. That of the lid was covered with a 1 *cm* square flap removed from the bulbar conjunctiva of the healthy eye. This was fastened by a continuous suture to the two margins of the conjunctival wound and to the upper margin of the tarsus—the small tarsal raw surface remaining uncovered. The margin of the flap still free was attached by a suture at either corner to the margin of the rectus expansion.

To cover the scleral wound a flap of mucosa, 12 *mm* long and 10 *mm* broad, was taken from the lower lip, the removal being made with the assistance of a modification of Snellen's blepharostat. This flap was attached to the ball by a continuous suture, while the upper margin was attached by two sutures to the free margin of the rectus expansion, the margin of the first flap being included.

The temporary attachment of the upper lid to the forehead was released and the lid turned down. The conjunctiva, which had been loosened at the inner and lower circumference of the cornea, 5 *mm* from the limbus, was fastened to the epibulbar tissue by a continuous suture.

The upper lid had become moderately swollen during the operation.

The course of the healing was smooth. The flap from the lid showed a complete red injection the first day after

the operation. Immediately after the operation, and for a few days longer, mobility downward was limited, but this was regained and the patient was discharged on the tenth day with a normally deep upper fornix.

Three months and a half after the operation the condition had not changed materially, and the operation seems fully to have accomplished its end.

In future cases I will do the operation in the following manner:

1. After separating the adhesions until the upper lid can be doubly everted,

2. a horizontal incision will be made in the expansion of the rectus where the retrotarsal fold should lie.

3. Then, in order to prevent excessive swelling, the lid will be replaced, and perhaps tampons be introduced, to check the hemorrhage.

4. After dissecting up the flaps the lid will be everted, so that the flaps may be sutured to the expansion of the rectus in the manner described.

5. It would seem better to cover the tarsal wound also, so as to prevent later a growing over it of the transplanted flap and to avoid the checking of the movements of the upper lid.

The advantages of the method lie in the fact that all the available anatomical and pathological relations are taken into consideration.

1. The transplanted flap is attached to the fornix as a natural fixed point.

2. From this it follows that the flap is capable of following all the changes of position of the lid with respect to the eyeball.

3. The transplanted flap is, through this fixation, better adapted to its surroundings and to its base, and therefore more readily becomes attached.

4. Later the expansion of the rectus exercises a constant traction on the new-formed fornix in the direction of the depth of the orbit, and thus prevents the shrinking that often occurs later.

CHANGES IN THE FUNDUS IN PREGNANT AND LYING-IN WOMEN.

By Dr. BRUNO BOSSE,

OBSTETRIC ASSISTANT TO THE UNIVERSITY CLINIC FOR WOMEN AT KOENIGSBERG (PR.).

Translated by Dr. WARD A. HOLDEN.

IT is a well-known fact that the physiological processes of the sexual life of women may exercise, under certain conditions, an influence upon the visual apparatus. Even normal menstruation may cause papillitis (Leber) or transient diminution of vision and contraction of the field without papillitis (Finkelstein), and abnormalities in the periodic fluxion of blood much more frequently lead to severer lesions which, so far as the fundus is concerned, are characterized by venous hyperæmia and evidences of transudation.

It is natural to assume that similar changes occur in pregnancy. The favoring conditions are the hydræmic quality of the blood, whose circulation is much impeded, and the branched venous network of the eye with its extensive lymph spaces. These conditions lead to changes elsewhere in the body — the hypertrophy of the heart in the pregnant, the disturbances in the thyroid and in the kidneys, the so-called puerperal osteophytes, etc. Therefore it seemed to me worth while to examine ophthalmoscopically the eyes of a number of women at the time of parturition, as well as before and after. Lack of time prevented determination of the refraction, the field of vision, and the like.

One hundred and twenty-four gravid women in the hospital were examined, ranging from the fourth month on, but about fifty per cent. were in the tenth month. There were

found signs of congestion in the optic disc, increasing in intensity and well marked from the seventh month, while in the tenth month about seventy-five per cent. of all the women presented such signs, but extreme degrees were rare.

The beginning seemed to be a venous stasis occasionally observed in the earlier months. Following this a condition of intense redness of the disc followed, in which the margin could still be recognized, but usually became obliterated in its nasal portion, giving place to a diffuse grayish-red, and later a darker, discoloration. If the vessel-funnel was in the middle of the disc, there was formed about it a more or less broad marginal zone, whose color was at first a veiled gray, and later a more positive gray. The margin of the disc, which was distinguishable in many cases, usually was obliterated first on the nasal side, and the sooner the nearer the color of the disc approached that of the choroid. At this time the disc is often indicated by the confluence of the vessels only. The moderate swelling, as evidenced by the parallactic displacement, concealed the lamina cribrosa or any physiological excavation, and sometimes apparently doubled the diameter of the disc. Both eyes were not always affected alike; the disc of one eye may not be recognizable, while the other is blurred at the nasal margin only. The venous stasis remains apparent in the tortuousness of the veins. Pulsation is rare. The retina is scarcely involved. Only in a single case was a small hemorrhage observed.

As appears in the description above, the symptoms were similar to those of optic neuritis. The remarkable feature, however, is that subjective disturbances never occurred.

An explanation of these processes is readily found in a hindered carrying off of the altered blood through the central vein. The process *per se* might represent an extension from the affected meninges. Opposed to this view are the unchanged state of the affection for months, and the absence of injurious effects upon the function of the eye. One must needs assume an increased intracranial tension leading to an accumulation of liquid in the intervaginal space which,

according to Manz, leads to œdematous swelling of the nerve-head.

The fact that the axis-cylinders are not permanently injured in spite of the long duration of the congestion is perhaps because the lymph in stasis contains no pathological elements, or such in great dilution only. Under the influence of prolonged labor and the more rapid circulation produced, a portion of the lymph is carried away; at least it was found that signs of stasis were present in only half of the women examined intra partum, although the stasis had been increasing in the last month.

The harmless nature of the processes described is shown by the speedy resolution of the changes, as observed in about three hundred cases. On the first day after labor in only one-eighth of the cases is the fundus normal; on the second day one-fourth; from the third to the tenth nearly one-half; on the eleventh day two-thirds, and on the fifteenth day no abnormality was found in any case.

The retrograde changes follow the same course as the progressive changes. The diffuse discoloration passes into one indicated on the nasal side only, the scleral and choroidal rings become visible again, the lost margins of the disc reappear, and the color becomes normal. The eye that has been less affected returns to the normal earlier than the other. Sometimes there were apparent residua of a true inflammatory process noted, such as white lines accompanying the vessels, and a fine striation about the entire circumference of the disc. Sometimes the regressive processes did not proceed uniformly by degrees, but in sector-like portions of the disc.

The results found in lying-in women who had not been examined while pregnant corresponded closely to those found in women examined both before and after labor (a total of fifty). By these patients also it may be proven that the swelling occurring in pregnancy gradually or rapidly passes off after labor in the course of from four to fifteen days. In four cases the duration of the swelling was longer, lasting eighteen, twenty-one, thirty-three, and seventy days before the process began to clear up. This delay in the regressive

metamorphosis may have been due to syphilis (1) and nephritis (3). This, however, seems doubtful, in view of the fact that among the thirty-four patients I examined that had nephritis, in some cases complicated with eclampsia, eighteen, or more than half, presented normal conditions. In twelve others the only change was that ordinarily found in pregnancy, and but the four remaining cases exhibited retinitis albuminurica or detachment of the retina.

Thus, by way of recapitulation, it may be said that in a large number of pregnant women there are changes in the fundus, located at the optic disc, and consisting in cloudiness and swelling due to venous stasis and transudation. These neuritic changes are innocent in that functional disturbances of the eye do not occur, or at least are not subjectively recognized, and that they disappear soon after labor, without distinction as to whether it is the first pregnancy or a later one.

ON THE NUTRITION OF THE CORNEA.

By Prof. ULRICH, Strassburg.

Slightly Abridged Translation by Dr. Ward A. Holden.

LEBER'S[1] statement that aqueous humor from the anterior chamber cannot enter the cornea so long as the endothelium on Descemet's membrane is intact, has, so far as I know, been introduced into most of the text-books of anatomy, although according to this view the anterior chamber regarded as a lymph space differs in a way difficult to understand from other large lymph spaces such as the peritoneum. In the following pages the question will be examined into anew.

In the entrance of liquid into the cornea through its posterior surface there are three processes to be considered: osmosis, filtration, and imbibition or swelling.

Osmosis brings about the chemical equivalence of two solutions which are separated by a septum. It is *per se* independent of differences in pressure but dependent upon the concentration of the two solutions or on the difference in their concentration, the quality of the dividing membrane, and other factors. In osmosis there are two currents in opposite directions. Colloidal substances such as albumen are not capable of being diffused.

Starting from these premises, it is clear that under ordinary conditions scarcely any osmotic exchange can take place between the cornea and the aqueous humor, for the simple reason that the difference in concentration between the

[1] *Graefe's Archiv*, xix., 2, p. 87.

corneal liquid and the aqueous humor (regarding both as saline solutions) is extremely slight.

The relations become different when for experimental purposes one introduces into the aqueous humor soluble substances such as ferrocyanide of potassium (Leber and Krükow, Knies, Weiss) while the liquid in the cornea is free from such substances. Then the ferrocyanide of potassium enters the cornea, as microscopic examination shows, through the endothelium.

The same result is obtained when the ferrocyanide is thrown into the blood current of the animal (by subcutaneous injection) and by this means reaches the aqueous humor (Ulrich). Here also it is the endothelium through which the ferrocyanide passes. From this undisputed experiment, Knies, Weiss, and I myself have drawn the conclusion that liquid from the anterior chamber may penetrate into the cornea.

Leber maintains, on the contrary, that this proves only that the molecules of the salt dissolved in water change their location and not that the solution of the salt in water enters the cornea (Heidelberg Congress, 1881).

This can be understood to mean only that Leber believes that the molecules of the salt separate from the molecules of water, with which a strong adhesion connects them, and wander isolated into the cement-substance of the endothelium.

Since this view has not been opposed but has expressly been concurred in, I am compelled, unwillingly, to take up the much disputed subject of osmosis theories.

Ludwig in his *Lehrbuch der Physiologie des Menschen*, 1858, speaks as follows: "The conditions for osmosis consist in the separation of two liquids differing in any respects, by a more or less porous membrane through which one or both liquids may pass."

Fehling says: "Diffusion of thin liquids takes place even through a membrane if the liquids can penetrate the membrane and become diffused through it; the separating membrane tends to become saturated with each of the two liquids which it separates."

There appears to be a certain discrepancy between these two definitions in that in one the imbibition of the diaphragm with one liquid is regarded as sufficient, while in the other imbibition with two liquids is assumed. The discrepancy falls, however, I believe, because absolute inability of imbibition of a diaphragm does not exist, but there is a marked difference as regards different liquids. The latter is the case, for example, when water and alcohol are separated by a caoutchouc membrane. "Water scarcely passes through a caoutchouc membrane, but alcohol passes readily through caoutchouc plates that are not too thick" (Hoppe-Seyler). "Water is scarcely taken up at all by caoutchouc" (Fehling).

That conditions like the latter do not exist in our ferrocyanide experiments is evident.

Since the cornea and the endothelial cells are normally pervaded with water, there can be no contention that like the caoutchouc membrane they are incapable of imbibing water, and therefore we must believe, following the definition of endosmosis given above, that the cement-substance may on the one hand become saturated with corneal liquid and on the other take up liquid from the anterior chamber. Imbibition is thus the preliminary stage of diffusion. When, therefore, Leber claims that the ferrocyanide molecules detach themselves from the water molecules and wander isolated into the cement substance, his assumption is contradicted on the one hand by the Brücke-Ludwig theory of osmosis, and on the other by the new investigations on imbibition by Hofmeister.

This author experimented with thin plates of size containing water, which were put into various aqueous solutions of salts and dyes. It was found that the size possessed a varying elective attraction for the different salts and dyes so that after certain periods they were found in the size in concentration other than that of the original liquid. The substances never passed over isolated into the size but always accompanied by water; the size plates swelled more or less.

"The increase in weight was composed of two factors, the absorption of water and the absorption of salts."

The result was different when a methylen-blue solution in

chloroform was used. Here under certain conditions all the dye passed into the size plate, which contained water, while none of the solvent chloroform passes into the plate.

Here was the case that Leber assumes for the ferrocyanide experiment, but of course the two solvents, aqueous humor and chloroform, cannot be placed parallel.

When, on the ground of these arguments, I differ with Leber and claim that in the ferrocyanide tests the blue color of the cement-substance of the endothelium (and of the cornea) proves that ferrocyanide of potassium and aqueous humor pass into it, it may be asked has this fact practical importance?

It was noted in the beginning of this paper why under normal conditions diffusion from the anterior chamber does not occur to any great degree. This is to be considered in the therapeutic use of iodide of potassium, salicylate of soda, atropine, and the like, and it is also of importance to have proved that the aqueous humor may pass into the cornea.

A second physiological process through which liquid can reach the cornea from the anterior chamber is filtration.

Indeed the well-known pressure relations in the eye furnish all the needed conditions, and I would emphasize one point on which apparently sufficient weight has not been laid, viz.: the constant change in intraocular tension. Manometric experiments show that the blood current in the eye, the action of the extrinsic muscles, and other factors keep up a constant variation in the intraocular tension. It is known how great an influence this may exert upon the filtration of liquids.

An unjustifiable importance has, it seems to me, been accorded for a long time to the so-called drop experiment.

It consists in squeezing an enucleated eye with more or less force between the fingers. Then, according to various authors, fine drops will appear on the external surface of the cornea, which have been regarded as aqueous humor that has filtered through. The drop experiment is supposed to be successful not only with the dead eye but also with the living. Other authors contradict this.

Martini says: "If one compresses an eye removed from an animal that has just been killed one will sooner burst the eye than force liquid from the cornea."

This was the state of the discussion when Leber began to study the matter.

After providing that in the living rabbit the cornea should be protected from the tears, he increased the tension of the eye greatly by introducing retractors or fixing the luxated eyeball with a rubber ring. In nine experiments drops appeared on the cornea of both eyes in one rabbit only, the results in the others being negative. Leber held that these experiments proved that the cornea during life permitted no noticeable amount of liquid to appear on its surface.

The results were quite different when he increased the tension of eyes of recently killed animals by injection into the anterior chamber or vitreous. Here liquid could be pressed through the cornea.

On the contrary positive results were not obtained by equally strong pressure with the hand on eyes that were still warm.

Analogous to the drop experiment is the filtration experiment of His, who bound the cornea over a glass tube and under a pressure of 2-3 decimetres of mercury found that the aqueous humor passed through the cornea. This experiment also was controlled by Leber, and he came to the same conclusions as His.

It is incomprehensible why the pressure of the fingers should act otherwise as respects the questionable filtration of aqueous humor than the other methods of increasing tension. However, the whole question seems to me to be of no great importance. For, on the one hand, as regards the nutrition of the cornea the problem is not whether aqueous humor can appear on the anterior surface of the cornea but whether it can enter the cornea, and on the other hand, the drop experiment and, to some extent, the other experiments do not seem to me to be suitable for solving the question.

For, if the drop experiment results negatively, that does not prove that aqueous humor does not pass into the

cornea ; if it results positively, the expressed liquid may quite as well be corneal liquid as aqueous humor. Therefore, in order to clear up the question, I have started in a new direction.

Before passing to this, however, I must describe briefly the experiment on which Leber based his theory as to the impermeability of the endothelium on Descemet's membrane. I may take it for granted that the experiment is well known and according to my own experience it cannot be questioned. It is indeed surprising to observe the behavior of the two corneas of an animal freshly killed, bound over glass tubes filled with aqueous humor, one cornea with its endothelium and the other without. When exposed to the air the surface of the cornea with intact endothelium soon becomes dry, while the cornea without endothelium, on the contrary, swells up into a size-like half-transparent globule.

From this and from analogous experiments on the living animal, Leber drew the following conclusions which are best stated in his own words: "The living cornea does not absorb water from the aqueous, and this leads us to the belief that in life some obstacles exist which prevent the entrance of liquids into the cornea but which after death are wanting."

This idea has passed into the text-books.

Were Leber's view as to the endothelium here correct, it must differ greatly from the endothelium lining other large lymph spaces, and the difference is the more marked because in the anterior chamber the conditions of tension are such as to favor the passing in of liquid.

In speaking of diffusion I endeavored to show that Leber's objection to the ferrocyanide test is untenable, since the finding of Berlin blue in the cement-substance indicates the process of diffusion which precedes imbibition with the liquid of the anterior chamber, and proves that there is a possibility of liquid from the anterior chamber entering the cornea. The following experiments will demonstrate an entrance of liquids without the existence of diffusion and without appreciable pressure.

When three corneas with a border of sclera are removed from freshly killed pigs or cattle, and placed for some hours

in a moist chamber, one intact, the second intact but holding aqueous humor in its concavity, and the third holding aqueous humor but having had its endothelium removed, one finds in from one and a half to three hours the first cornea thin, the second somewhat thicker, and the third considerably thicker. The difference in thickness is particularly noticeable when the corneas are divided through the middle and the cut edges compared. This condition can only be explained on the ground of swelling. But the fact that swelling of the cornea does not occur in life does not affect the validity of the experiment.

First it is to be remembered that all protoplasm is to be regarded as a swollen mass, but the normal cornea shows no pathological amount of swelling. Does the now increased swelling obtained in the experiment furnish the proof that the living cornea possesses, in the lymph vessels of the conjunctiva, outflow channels for its lymph, which after death cease to functionate?

Modifications of this experiment lead to conclusions not so evident. When I filled the anterior chamber of a fresh ox's eye with air injected through the sclera, while another eye was left undisturbed, the cornea of the latter eye appeared thicker and more cloudy than that of the former after they had been left together for seven hours in the moist chamber. If the experiment was interrupted after an hour and a half no difference could be observed.

If fresh eyes of oxen have a rubber band passed round the equator the cornea becomes opaque.

I believe I am justified from these experiments in concluding that the endothelium of Descemet's membrane does not check the entrance of aqueous humor into the cornea by imbibition, but only limits it; if, however, imbibition is possible, as is proved by the entrance of ferrocyanide of potassium into the cement-substance, the influence of varying intraocular tension, *i. e.*, filtration, must be taken into account.

No one to-day believes in filtration through the cornea. One can readily convince himself, as I did years ago by means of subcutaneous injections of ferrocyanide of potas-

sium, that the solution entering the cornea from the anterior chamber always extends toward the periphery of the cornea, not only when it enters at the corneal margin but when it is taken up in the centre of the cornea. This phenomenon cannot be explained by diffusion, but only by a falling pressure directed centrifugally.

Thus the moderate amount of aqueous humor entering the cornea by means of the regulating function of the endothelium is carried off toward the conjunctiva, and opacity and swelling of the cornea are avoided.

It seems to me that with this assumption all physiological, anatomical, and clinical observations agree.

There is, in general, a complete analogy between the anterior chamber and other lymph cavities, in which the removal of the endothelium likewise causes only an increase in the absorption of liquid. The outer skin acts similarly. The experiments of His and Leber in no way oppose this view.

If we take the standpoint that a certain quantity of aqueous humor constantly passes into the cornea, and that the endothelium has only a regulatory function, the question arises whether deep opacities of the cornea complicated with synechiæ may not play a rôle in the production of increased tension. This question has a certain interest, although today a corneal affection of this sort is not regarded as a *prima causa movens*, but merely as an assisting factor.

Some years ago I made a series of experiments on dogs, to determine whether deep scars in the cornea influence the imbibition or the lymph circulation at these points.

It seemed to me of particular importance to eliminate the membrane of Descemet and the normal deeper layers of the cornea, preserving as well as possible the superficial layers and the cornea in general.

For these reasons a cataract knife was passed into the corneal substance and a strip several millimetres broad removed. This, extending vertically, comprised the superficial layers of the cornea and remained attached above and below.

Beneath this bridge the anterior chamber is entered, a

portion of the deeper layers of the cornea extirpated, and the defect immediately closed with the superficial bridge. Recovery takes place quickly, sometimes without and sometimes with a small anterior synechia. Later I simplified the operative procedure, separating the superficial bridge below and with it covering the deep excision made above. A certain amount of retraction of the flap occurred, but the anterior chamber remained closed.

In an eye operated on by the first method, July 28, 1893, the condition on August 11, 1893, was as follows: The pupil free, the cornea clear except at the place of extirpation, where there was an irregular opacity. On August 19th, fluorescin was injected subcutaneously. An area about the corneal opacity stained most intensely, while the opacity itself remained unstained. The other eye, operated on July 1, 1895, healed with a small anterior synechia. Here the leucoma stained clearly yellow, apparently in consequence of the vascularity of the adhesion.

A fluorescin experiment on a dog operated on by the second method resulted in the same way.

The following experiment was then undertaken: The dog was killed fifty-seven days after the operation, which had not been followed by an anterior synechia. The cornea, with the adjoining sclera, was cut off, the endothelium of the membrane of Descemet removed, and the cavity filled with aqueous humor. The cornea swelled in the usual way; the scar, however, appeared retracted and surrounded by a wall of swollen cornea.

The microscopic condition found after the healing of the deep extirpation was as follows: At the margins of the excision scar the ends of Descemet's membrane appeared curved more or less forward. The portion of the cornea removed was replaced by a new-formed fibrillar tissue, with spindle cells having long nuclei. This tissue extended over the ends of Descemet's membrane, and contained some pigment. The scar was never covered with endothelium.

These experiments seem to show that the scar tissue is less capable of imbibition than the normal corneal tissue, and that perhaps the lymph circulation offers certain hindrances.

REPORT OF THE PROCEEDINGS OF THE SECTION OF OPHTHALMOLOGY OF THE THIRD PAN-AMERICAN MEDICAL CONGRESS, HELD IN HAVANA, CUBA, ON FEBRUARY 4, 5, 6, 7, 1901.

By Dr. C. E. FINLAY, Havana, Cuba.

FIRST SESSION, FEBRUARY 4.

Chairman: Dr. J. Patron Espada, of Yucatan, Mexico.

Dr. Andrade, of Venezuela, read a paper on the **etiology of ulcus rodens,** based on the observation of two cases which he studied at Prof. Secondi's clinic in Genoa. He calls attention to its clinical features and to differences between them and those of ulcus serpens. He has not found the prognosis to be as bad as usually held, having brought one of his cases to a standstill with subconjunctival injections of sublimate, and having in the other obtained a marked improvement by the use of an antiseptic eye-wash, hot fomentations, and occlusion. He believes the pathology of the disease to consist in a local infection, and in his two cases was able to isolate a bacillus which reproduced the affection when inoculated into the cornea of a rabbit. The bacillus in question was the shape of a small mobile rod, the bacilli at times lying side by side, at times being grouped as diplobacilli, or forming long ribbons. It is colored by Gram's method, liquefies gelatine and Loeffler's blood serum. It grows with difficulty on agar. It does not produce indol, and although it does not ferment glucose or lactose, it acidifies media containing the former; it requires oxygen to grow well. Dr. Andrade does not claim for this bacillus the exclusive etiology of ulcus rodens.

Dr. Patron Espada, of Yucatan, Mexico, asks if the ulcer is always marginal, and if the diminution in the sensibility of the cornea was great.

Dr. ANDRADE stated this to have been slight in his cases.

Dr. FINLAY, of Havana, mentioned a single case of ulcus rodens which he had seen; in it there was marked anæsthesia of the cornea, and the lesion appeared to him to be of a neurotrophic nature. By the use of the cautery, antiseptic eye-washes, occlusion, and the internal administration of strychnine he was finally able to bring his case to a standstill only after it had seriously impaired sight on account of the extensive though superficial opacity of the cornea which resulted. He had made no cultures. He mentioned another case, which he has under treatment, and which he had shown to Dr. Andrade, which had some of the characters of the ulcus rodens, being essentially different from the ordinary ulcus serpens, coming more under the marginal ring ulcer of Swanzy; there are two ulcers, one parallel to the superior and the other to the inferior corneal margin and about 1 *mm* from it, blood-vessels passing into them; both ulcers are superficial, there being no hypopion. He had cauterized them and occluded the eye, which seems improving.[1] From some cultures he had made he had isolated a bacillus, which takes the Gram stain and which he is now studying, associated with the ordinary staphylococcus.

Dr. DEHOGUES, of Havana, has seen cases of marginal corneal ulcers, but none of ulcus rodens.

Dr. J. SANTOS FERNANDEZ, of Havana, states that he has employed subconjunctival injections of mercury in the treatment of corneal ulcers with a moderate amount of success; he prefers iodoform ointment.

Dr. H. B. Young, of Burlington, Iowa, has seen a case of ulcus rodens complicating an attack of facial erysipelas. He obtained a good result from the use of iodine tincture. In reference to the etiology, he thinks the nature of the soil should be taken into consideration.

Dr. ANDRADE thinks the nature of the soil has a great influence on the course of the affection, hence the gravity of the cases seen in the hospitals, where the majority of the patients are poorly nourished; one of his Genoa cases occurred in a soldier who formed part of the forces defeated at Erythrea, having in consequence undergone many hardships; he had, besides, heart disease. He states that in Genoa he had seen a great deal of the

[1] The case has since recovered, with an insignificant marginal opacity which does not affect sight.

employment of subconjunctival injections of mercury salts in the treatment of corneal ulcers; the quantity injected at Prof. Secondi's clinic was a whole syringeful; in some cases of hypopion keratitis the results were marvellous, whilst in others perforation and sloughing of the cornea seem to have been accelerated; these differences depend, he thinks, on the condition of the conjuntiva, being contra-indicated where there is much chemosis.

Dr. J. PATRON ESPADA, of Yucatan, Mexico, read a paper on **the ocular manifestations of leprosy.** He considers the ocular manifestations of leprosy to be secondary in nature, not primary. He considers in detail the lesions found in different parts of the eye, finding them confined almost exclusively to the anterior segment. He has found two varieties of corneal lesion: that of a more or less circumscribed tumor, leproma, which often extends beyond the area of the cornea, being mistakable for a leucosarcoma; and that of an interstitial keratitis similar to the syphilitic and tuberculous varieties. Anæthesia of the cornea usually accompanies these lesions. Secondary lesions of a glaucomatous nature are at times observed in connection with the corneal ones. As regards the iris, besides a serious iritis, he has observed a special form hitherto not described, in which the color of the iris is not affected and in which numerous grayish points, about the size of a pinhead, are to be observed on its surface, these points being especially abundant in the neighborhood of the sphincter. In one case this miliary eruption was not accompanied by any marked reaction; in another the pupillary margin was bound down by posterior synechiæ; in the first case all signs of the iritis had disappeared six months later. The most frequent form of iritis is, however, the plastic, with the formation of a more or less thick pupillary exudate and more or less serious affection of sight. Large lepromata of the iris are also at times observed, especially at the iris angle. The ciliary body is often involved, but it is rare to have, on this account, any acute symptoms, the only signs of cyclitis often present being deposits of exudation on the posterior surface of the cornea. He has not observed any choroidal or retinal lesions, although their occurrence is mentioned as a rarity by some authors. He concludes: 1. that the ocular lesions of leprosy are limited to the anterior segment of the eyeball; 2. That the eye is affected secondarily and is not to be regarded as the point of entry of the infection.

Dr. ANDRADE is interested in finding among the lesions an

interestitial keratitis, as he has for some time held that this affection is not so exclusively syphilitic as usually taught.

Dr. J. SANTOS FERNANDEZ has unfortunately had the opportunity of seeing a good deal of the ocular manifestations of leprosy. He believes that in a good many of the cases the eye is affected primarily, as evidenced by the greater number of bacilli found in the superficial layers of the lepromata. He has operated successfully for cataract in lepers, as have also Drs. Montalvo and Lopez, of this city. Thinks that in some cases presence of an interstitial keratitis may be due to an association with syphilis or tuberculosis.

Dr. C. E. FINLAY has seen few cases of ocular leprosy in private practice, but has on two occasions carefully gone over the patients confined in the Leper Asylum of this city, having found ocular lesions in about 60 to 70 per cent. of the cases. He agrees with Dr. Patron in considering them as secondary to a systematic infection ; he likewise found the lesions limited to the anterior segment of the eyeball, by far the most common lesion being episcleral nodules which gradually invade the periphery of the cornea, the iris, and ciliary body, finally destroying sight. He thinks the differential diagnosis between the interstitial keratitis of leprosy and the other varieties easy if the presence of other stigmata of the disease is considered. He has also observed the anæsthesia of the cornea when this is affected, as is the case with most lesions of the disease in different parts of the body. He calls attention to the special form of iritis described by Dr. Patron. He notices an important omission in Dr. Patron's paper, that only casual mention is made of the falling of the eyebrows, whereas this symptom, to which attention was called in a paper published several years ago in the ARCHIVES OF OPHTHALMOLOGY by Dr. E. Lopez, of this city, may be regarded as a premonitory symptom of the disease being present in almost every case ; it is usually accompanied by anæsthesia of the superciliary legion ; he has not seen a case of leprosy where it was not present.

Dr. RAMONELL, of Havana, read a paper on **cataract statistics in the West Indies and Mallorca.** Dr. Ramonell, who has practised 16 years in Mallorca and 4 years and 7 months in the West Indies, finds cataract more frequent in the West Indies, and attributes the difference to the climate.

Dr. PATRON ESPADA finds Dr. Ramonell's observations most interesting.

Dr. J. SANTOS FERNANDEZ does not believe that the climate has any influence on the production of cataract, else it would be more frequent among firemen and engine drivers. Dr. Lopez, of this city, some years ago published some observations on the influence of the mean temperature of Cuba on different diseases of the eye. From a careful study of this paper and of his own and other Cuban oculists' statistics, Dr. Santos Fernandez, in a paper presented in 1892 to the Climatological Society of Chicago, came to the conclusion that the different eye diseases were about equally frequent here and in Europe and North America.

Dr. DEHOGUES states that before one can admit the influence of climate in the production of cataract one has to exclude that of the refraction of the eye, especially that of hypermetropia, here the greater number of patients being hypermetropic.

Dr. C. E. FINLAY considers that, whilst here one possibly sees more cataracts, in proportion to the total number of patients, than in other localities, one must be very careful in drawing conclusions from statistics; that before admitting such an obscure factor as the climate several others have to be discarded, viz.: the greater frequency of granulated lids in Europe, the almost total absence from our consultations of squint cases (due to a widespread popular prejudice against squint operations). He does not believe that climate has any influence on the production of cataract.

Dr. J. SANTOS FERNANDEZ corroborates Dr. Finlay's statements regarding the popular abhorrence to squint operations and the consequent rarity of one being consulted for this widespread defect. He believes that cataracts are more frequent among hypermetropes on account of the greater frequency of this refractive condition.

Dr. ANDRADE endorses Dr. Finlay's views and states that in Venezuela the same prejudice exists against squint operations, whilst, on the other hand, in the European clinics one often accidentally comes across mature cataracts, in patients seeking advice for other ills, which they had not noticed or which they did not seek to remedy, inspired by the fatalism prevailing there among some of the lower classes, this not seeming to occur in these countries.

Dr. YOUNG asks whether any of the gentlemen present had observed astigmatism against the rule in cases in which cataract had subsequently developed.

Drs. RAMONELL, FERNANDEZ, and FINLAY state that they have made no observations in that direction.

Dr. RAMONELL replies to Dr. Santos Fernandez's arguments by calling attention to the fact that the proportion of firemen and engine drivers suffering from cataract to that of the total number of the cases is too small to allow any conclusions to be drawn from the frequency or rarity of cataract among them. In referring to the influence of refraction in the production of cataract, Dr. Ramonell refers to the increase in the refraction of the eye which accompanies the development of a cataract.

Dr. SANTOS FERNANDEZ explains that his argument of the engine drivers was of secondary importance, that his opinion was based principally on the statistics which he had compiled and published in 1892.

SECOND SESSION, FEBRUARY 5.

Chairman: Dr. H. B. YOUNG, of Burlington, Iowa.

Dr. J. MULLEN, of Houston, Texas, reports a case of **resection of the superior cervical ganglion of the sympathetic for non-inflammatory glaucoma.** He reviews the physiological grounds for the operation. As regards the operative procedure, he prefers the posterior route. The patient, a woman, had had an iridectomy performed twenty-three years before, there having been since a gradual decrease in sight. Resection of the superior cervical ganglion of the sympathetic resulted in a primary improvement in vision; after some months, this began again to diminish and the visual field to contract; this decrease has continued to progress although the vision is still better than it was before the operation. Concludes that no permanent improvement can be brought about by the operation.

Dr. J. SANTOS FERNANDEZ does not think that the operation should in the present light of our knowledge be either absolutely accepted or rejected till we have gained more experience with regard to it, especially as glaucoma is a disease against which our therapeutic measures are so limited.

Dr. ANDRADE agrees with Dr. Santos Fernandez and suggests that possibly excision of both sympathetic superior cervical ganglia may be more effective than that only of the affected side.

Dr. FINLAY has had no experience with the operation, but considers it justified in cases where sclerotomy, iridectomy, and

other measures have already failed, Dr. Mullen's case proving that at least a temporary improvement can be brought about.

Dr. PATRON asks whether scleral puncture was first tried.

Dr. MULLEN thinks that the operation should only be performed in chronic cases; it has the advantage of not disfiguring the patient. He has not tried scleral puncture.

Dr. C. E. FINLAY, of Havana, Cuba, reads a paper on **alcohol and tobacco amblyopia in Cuba,** published in full in this number.

Dr. J. SANTOS FERNANDEZ finds the paper interesting as not in accordance with the views he has on different occasions expressed. He has found tobacco amblyopia rare in Cuba and alcohol amblyopia frequent.

Dr. ANDRADE has had little experience in tobacco or alcohol amblyopia in these climates; but states that in Europe it seemed more frequent among those who chewed tobacco than in those who smoked it. He thinks that the presence or absence of diabetes should be taken into consideration.

Dr. DEHOGUES thinks that the quality of the tobacco is of great importance, and that it is more frequent here since the war and since the Cuban tobacco has been more or less adulterated with inferior Porto Rico leaves or seed.

Dr. RAMONELL thinks that the quality of the tobacco has great importance, the disease in France being more frequent among those who smoke pipe tobacco. He thinks the less frequency here is due to copious perspiration.

Dr. MULLEN agrees with Dr. Finlay in the necessity, in treating these cases, of totally suppressing the tobacco, no partial suspension answering.

Dr. ANDRADE asks whether any of the cases reported had taken morphine.

Dr. FINLAY, in reply to the last question, states that he remembers having found in one of his patients a history of abuse of morphine. In reply to Dr. Santos Fernandez, he states that he is aware that both he and De Wecker hold that tobacco amblyopia is rare in the Spanish race, but that, his experience having proved contrary to their authoritative statements, he has felt bound to present his cases in a tabulated form where they can be studied individually. Even if the influence of tobacco is excluded in all the mixed cases, there still remain 31 pure tobacco cases in computing which he has been as careful as pos-

sible, thinking himself justified in considering tobacco as the toxic agent in cases where, with a history of no taking of alcohol at all or only in moderate quantities at mealtimes, there has been one of smoking fifteen and twenty cigars a day, not counting a large number of cigarettes. As regards the quality of the tobacco, in one of his cases this was not at fault, the patient being one of the higher employees of one of the best tobacco factories here; this patient smoked the very best tobacco made, and did not drink; he had an absolute central scotoma. Dr. Finlay, however, admits that bad tobacco may possibly be more toxic than the good. He has observed several cases in women, and has now under treatment a typical case of pure tobacco amblyopia, which he offers to demonstrate to any of the members who may desire to see it.

THIRD SESSION, FEBRUARY 6.

Chairman: Dr. J. SANTOS FERNANDEZ, of Havana, Cuba.

Dr. FINLAY read a paper by Dr. CHARLES A. OLIVER, of Philadelphia, Pa. on a **case of blindness from sympathetic ophthalmitis complicated with secondary glaucoma.** Restoration of vision by two iridectomies, one with extraction of lens, an iridocystectomy, and Tyrrell's operation of drilling. Injured eye removed after sympathetic inflammation had appeared in the other; increase of symptoms of the latter kept in check by appropriate treatment. Occurrence of acute glaucoma in sympathizing eye relieved by iridectomy. Second iridectomy and extraction of lens to prevent recurrence of glaucoma. Continuance of an iridocyclitis resulted in a pupillary obstruction which was attacked first by a Knapp's iridocystectomy and finally by a Tyrrell's drilling operation. Final vision: $\frac{1}{2}$.

Drs. SANTOS FERNANDEZ and RAMONELL think that Dr. Oliver is to be congratulated on having brought such a serious case to such a satisfactory termination.

Dr. FINLAY read a paper by Dr. A. DUANE, of New York, on **a new clinometer for measuring torsional deviations of the eye, estimating the degree of torsion produced by cylindrical glasses, and detecting paracentral scotomata and metamorphopsia.** Dr. Duane mentions that whilst the Maddox rod has already been pointed out as useful in estimating torsion of the eye, its utility has not been generally recognized. Adapted to determination of torsion in ocular paralyses and in

determination of cyclophoria, it has, however, a much wider range of application, viz.: ability of eye to determine when different lines are vertical or horizontal and whether two intersecting lines form right angles, and how patient's estimates are affected by the addition of glasses. For the purpose he has devised a combination of a double Maddox rod (one before each eye) with Stevens phorometer. He first measures for each eye separately the lateral deviation necessary to make light line vertical, afterwards testing both eyes simultaneously. He then measures in the same manner the deviation of horizontal lines. To obtain accuracy in determination of right angles, he places a Maddox rod before each eye (of different color) and rotates each till patient finds both lines perpendicular, then reading the deviation from the normal; when normal, deviation of both lines should read the same. Apparatus can also be used for testing heterophoria.

Of 46 cases tested 34 turned out normal (deviations of less than two to three degrees). Of the remaining cases Dr. Duane considers:

Two as probably normal, a single observation indicating abnormality being probably erroneous.

In two others the moderate amount of torsion could scarcely be considered abnormal, although consistency in findings and the fact that the patient was unable to draw perpendiculars showed that the relations of the vertical meridians were not quite normal.

In two cases a considerable amount of uncorrected ametropia probably accounted for the deflection observed.

In three cases torsion could be attributed to ill-fitting glasses.

In one case with marked torsion, in which perpendicular test proved satisfactory, paresis of ocular muscles could be excluded.

In two cases, finally, of paralysis of ocular muscles, clinometer was used to determine tilting of image, in one, tilted image belonging to the non-paralyzed eye.

Thinks it can be used to determine distortion by cylinders, rotating rods till lines are perpendicular, and seeing if deviation constant and, if so, measuring it.

Has used clinometer to detect scotomata and retinal metamorphopsia; line appearing broken or distorted; for this purpose test must be repeated with rod in different meridians. It is particularly applicable in detecting ring scotomata. He has had occasion to test it in a case of detachment of the retina.

(In view of the interesting nature of Dr. Duane's paper, a resolution was passed to have it translated into Spanish and to publish it in both languages in the Book of the Congress.)

Dr. FINLAY read a paper by Dr. J. LAWTON HIERS, of Savannah, Ga., on **malarial infection as a potent factor in asthenopic conditions.**

Dr. J. SANTOS FERNANDEZ, of Havana, Cuba, read a paper on **retinal asthenopia of sponge fishers.** This is based on the report of four cases, mostly distinguished by intolerance of light, with a sort of haze before the eyes, and muscæ; the visual acuity, visual field, and color perception remaining normal. Ascribes it to a hyperæsthetic condition of the retina brought about by the manner of practising their profession. Describes process of sponge fishing: fishers placing heads in a barrel and searching for sponges in bottom of the sea through glass bottom of boat; once found, spearing them. Thinks that efforts to see in a poor light is the cause of the condition. All the cases recovered under rest and the use of dark glasses.

Dr. RAMONELL thinks that scintillating of the sun in the water is the cause of the trouble; that fishers have told him that this is less disagreeable when the sky is clouded. He believes this asthenopia may be the beginning of hemeralopia; he has seen several cases of hemeralopia in patients coming from the seaside.

Dr. DEHOGUES, who has had no personal experience with this asthenopia, asks whether excess of convergence may not come into play in its production.

Dr. RAMONELL explains that the depth of several yards at which sponges lie excludes any idea of excess of convergence.

Dr. FINLAY has seen none of these cases, but from description agrees with Dr. Santos Fernandez in considering the condition one of hyperæsthesia of the retina, brought about by the fatigue consequent on efforts at seeing more or less accurately in a dim light, still further enhanced by the glaring sunlight which they find around them on raising their heads from the barrels.

Dr. J. SANTOS FERNANDEZ thinks that the scintillating of the sunlight in the water may have some influence in the production of this asthenopia, but does not think there is the slightest ground to consider these cases as incipient hemeralopias.

Dr. J. SANTOS FERNANDEZ read a paper on the **sterilization of the instruments used in ophthalmology.** Finding that the usual means of sterilization blunt the cutting edge of the

knives employed in eye surgery, he institutes a series of experimental inoculations of culture media with knives submitted to various processes, which he describes in detail; he concludes that clean new knives can be sterilized by simply wiping with sterile cotton. For other eye instruments uses same means as employed in general surgery.

Dr. DEHOGUES has found that most antiseptic solutions spoil the cutting edge of the knives used in ophthalmic surgery; he wipes his knives with a piece of cotton soaked with chloroform, placing them afterwards in dish with a boric acid solution.

Dr. RAMONELL, following advice given to him several years ago by Luer, keeps his knives smeared over with cacao grease. At time of operation he boils some water, and, when this is tepid, washes knives with it, wipes them with salicylic acid cotton, puts them for a moment into a boric acid solution, and dries them with cotton.

Dr. FINLAY states that while the results of Dr. Santos Fernandez are in conformity with those performed by Dr. Knapp some years ago in one of the Berlin laboratories, proving that polished and sharp instruments when dry are not likely to carry germs, and although he admits that the usual sterilization of knives by boiling blunts their cutting edge, he nevertheless persists in boiling his instruments, transferring them afterwards to a dish containing some sterile solution, whence he takes them as he requires them, preferring all the inconveniences connected with this conduct to running an extra risk of infection.

Dr. J. SANTOS FERNANDEZ has also used chloroform and immersion in boiling water with good results. He thinks that the greasing of the instruments predisposes to infection, and that if resorted to the knives should be washed in boiling and not tepid water.

Dr. J. SANTOS FERNANDEZ reads a paper on **iridectomy after simple extraction of cataract,** recommending it as a last step in the operation, in order to avoid a subsequent prolapse, in those cases where there is much cortex or where the patient shows an inclination to restlessness.

Dr. RAMONELL asks whether Dr. Fernandez has not used eserine for the purpose.

Dr. SANTOS FERNANDEZ states in reply that he considers the use of myotics after cataract extractions as harmful.

Dr. FINLAY does not agree with Dr. Santos Fernandez in the

necessity of performing iridectomy after the expulsion of the lens, excepting where the iris shows a decided tendency to prolapse resisting replacement into the anterior chamber. He examines the eyes of his patients operated for cataract every day, and if he finds a prolapse of iris, abscises it; this conduct, which he saw first practised by Dr. R. O. Born at Dr. Knapp's clinic, is now the rule there. As regards the employment of eserine as a preventive of prolapse, he agrees with Dr. Santos Fernandez in considering it useless if not harmful; when he first commenced to study ophthalmology at Knapp's clinic it was used in every case; while he was with him he gradually saw him use it less and less till he had finally abandoned it for some time before he left him.

Dr. SANTOS FERNANDEZ feels the same repugnance that Dr. Finlay does to iridectomizing eyes from which he has already successfully extracted a cataract, thus spoiling the cosmetic effect of the operation; he does not advocate that it should be performed in every case, but only where there is much cortical left behind or where the patient is very restless. He quotes Dr. Knapp as being opposed to the abscission of prolapses, recommending them to be left alone.

Dr. FINLAY explains Dr. Knapp's teaching as regards the conduct to be observed with prolapses, viz.: abscission when seen within the first twenty-four hours, and abstention from interference when seen later, as by that time adhesions have formed between the iris and the lips of the corneal wound preventing a complete replacement into the anterior chamber, abscission only opening a new door through which infection may enter. On this account, formerly, when Dr. Knapp did not look at his cataract eyes till the third day, the prolapses he met came under the latter class and consequently he left them alone; but now that he examines his eyes every day, from the second on, the prolapses that he meets come under the former class and he acts accordingly. He refers to article by Knapp in Norris and Oliver's text-book for more details.

Dr. SANTOS FERNANDEZ does not consider this conduct practicable in private practice; he dislikes exceedingly to reoperate on eyes operated on a few days before; he does not remember ever having done it; he thinks that the effect on the patient and the persons around him would be very bad.

Dr. J. DEHOGUES reads a paper on **neuroma of the optic**

nerve. The patient was a child 12 years of age. Duration at time of operation : 8 *mos.* Extirpation of eyeball and tumor. This completely surrounded nerve and posterior pole of the eyeball ; it had a whitish color, was of soft consistency. Dimensions : 3 *cm* long, 4½ *cm* in diam. Histological examination by Dr. Carvallo, who diagnosed an fascicular neuroma, composed almost exclusively of Remak fibres.

Dr. FINLAY is sorry not to feel himself justified in admitting the histological diagnosis of the tumor. Apart from the fact that such authorities as Fuchs deny the existence of these tumors, from this one's description, as well as from a cursory examination he has made of one of the slides, he is of the opinion that the tumor belongs to the connective-tissue group (fibroma or fibrosarcoma), the nerve fibres which it contains belonging to the optic nerve.

Dr. RAMONELL endorses Dr. Finlay's views.

Dr. SANTOS FERNANDEZ congratulates Dr. Dehogues on having had such a rare case ; is undecided as regards the histological question at issue.

Dr. DEHOGUES lays the responsibility of the histological diagnosis on Dr. Carvallo, who, he states, bases his opinion on the presence in the tumor of Remak fibres.

Dr. FINLAY read a paper by Dr. M. URIBE TRONCOSO, of Mexico, on **some observations regarding the employment of protargol in ocular therapeutics.** He has used protargol with good results in ophthalmia of the new-born, blenorrhagic ophthalmia, acute catarrhal conjunctivitis, dacryocystitis, and corneal ulcers ; considering that it can completely substitute nitrate of silver. He believes the failures of some have been due to lack of previous cleansing, the use of weak solutions, or the too long keeping of these before using them.

Dr. SANTOS FERNANDEZ has used protargol with a fair amount of success, but prefers nitrate of silver, with the handling of which he has had more experience.

FOURTH SESSION, FEBRUARY 7.

Chairman : Dr. J. PATRON ESPADA, of Yucatan, Mexico.

Dr. LUIS H. DEBAYLE, of Nicaragua, reads a paper on **arteriovenous aneurism from rupture of the internal carotid in the cavernous sinus,** based on the report of two cases of spontaneous rupture. He first briefly reviews the ana-

tomical relations between the internal carotid and cavernous sinus, with results brought about in the shape of changes in the blood pressure, obstruction to the venous circulation of the orbit by the rupture of the artery in the interior of the sinus; the literature on the subject; the etiology; the symptomatology; course; and gross pathology. He describes the microscopic lesions present in non-traumatic cases; at times finding the typical lesions of atheroma, at others those of an endarteritis of syphilitic nature, or those of an arterio-sclerosis. In one of his cases, where a histological examination was made by Dr. Brown-Webber, a special form of endarteritis was found, which, while not corresponding to the syphilitic or atheromatous forms, presents some points of resemblance to the endarteritis of arterio-sclerosis, lesions being mostly circumscribed to the tunica interna, with new formation of tissue involving principally the epithelial (endothelial) lining of the vessels (endarterite proliferative of Lancereaux); in this variety, however, little tendency to formation of aneurism; he ascribes endarteritis of his case, where with this variety of greater implication of tunica interna there was a decided tendency to formation of aneurism, to malarial poisoning.

He next reviews the prognosis, diagnosis, and treatment of the affection, expressing his preference as regards the last to the ligature of the internal carotid.

His first case was that of a woman, forty years of age, who had no syphilitic antecedents, but who had lived for a long time in a malarial district, having had several attacks of malarial fevers, an examination of the blood a few days before death having revealed the presence of the malarial parasites. Symptoms developed suddenly during efforts at vomiting, increasing during next few days. Digital compression not having produced the desired result, ligature of the internal carotid was performed with gradual abeyance of the local symptoms. A few months later, another aneurism developed lower down in the carotid, near the arch of the aorta. Death resulted from external rupture. Autopsy confirmed all points of diagnosis, microscopic examination showing lesions of peculiar form of endarteritis described above. The second case occurred in a man of 35, with no syphilitic or tuberculous antecedents, who had abused alcohol and morphine. Gradual development of symptoms during the course of a month. Ligature of the internal carotid refused. Death from hemorrhage into nose. Autopsy refused.

Dr. PATRON requests reasons for Dr. Debayle considering malaria the cause of the lesion.

Dr. DEBAYLE replies, enumerating the patients's malarial antecedents, and lays stress on exclusion of other causes.

Dr. SANTOS FERNANDEZ thinks reasons conclusive, considering Dr. Debayle's case most interesting.

Dr. YOUNG has seen no similar case.

Dr. ANDRADE considers case most interesting not only on account of minuteness of description, but also on account of a pathological examination having been made. He agrees with Dr. Debayle in considering malaria as the cause, the preparations presented by Dr. Debayle showing the lesion to be limited to the tunica interna and altogether different from that of syphilitic endarteritis.

Dr. SANTOS FERNANDEZ repeats that he considers case most interesting and that it proves that malaria is an important factor in the production of arterial lesions.

REPORT OF MEETINGS OF THE OPHTHALMOLOGICAL SECTION OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. HENRY H. TYSON, Secretary.

The President, Dr. JOHN E. WEEKS, in the Chair.

I.—MEETING OF JANUARY 22, 1901.

At the annual election of the Section, Dr. John E. Weeks was elected President, and Dr. Henry H. Tyson Secretary for the ensuing year.

Dr. T. R. Pooley presented a case of **sudden total one-sided blindness, without ophthalmoscopic signs.** The patient was a man who previously had had diplopia due to paresis of the external rectus of the right eye; he suddenly lost the sight of his right eye three weeks ago. Pupil dilated, no reaction; ophthalmoscopic appearance negative. Some hyperæmia of retinal veins in both eyes. Left pupil slightly sluggish. Field normal. Knee reflex normal. Has syphilis. Cause: pressure upon optic nerve at chiasm or in the orbit. Descending atrophy of the optic nerve will probably show later. The question is whether large doses of iodide of potassium will relieve case before total atrophy manifests itself.

Dr. Claiborne stated that the patient is taking iodide of potassium grs. cxx. daily; but he would give that amount three times a day.

Dr. Leszynsky thinks that the patient has trouble with the 3d, 5th, and 6th nerves, and that a thorough examination would reveal some other involvement of the central nervous system. He suggested mercurial inunctions followed by iodide of potassium. He remembered seeing a case with no ophthalmoscopic signs

until three weeks after blindness, then œdema of disc appeared, followed by optic neuritis and atrophy of the optic nerve.

Dr. CALLAN recalled one case of a woman, aged forty-five years, who complained of failure of sight. Examination showed a small exudation at macula lutea, but no other changes. Blindness followed one month later. Autopsy revealed a glioma at the chiasm. No atrophy of nerve was found before death.

Dr. WEEKS thought the case was probably one of pachymeningitis.

[Dr. CALLAN in the Chair.]

Dr. WEEKS reported a case of **abscess of brain, frontal lobe, with orbital cellulitis.** Specimen.

He exhibited a brain with abscess of the left frontal lobe, which had been removed at the autopsy of a patient who had come to the New York Eye and Ear Infirmary on December 15th with orbital cellulitis. The patient, a male aged thirty-five years, gave a history of having suffered from toothache, first left bicuspid, three weeks previously, which lasted two or three days. Swelling of the left eye was first noticed on December 12th. On December 15th there was exophthalmos, not very pronounced. On pressure over the lower lid pus exuded from a small opening in the lid near the inner canthus. Eyeball immobile; slight chemosis. Cornea clear. Vision fair. The patient was admitted to the Infirmary. On the succeeding day the swelling of the lids and the exopthalmos had greatly increased. Free incisions were made in the orbital tissue through the lids, above and below. Very little pus was encountered. Free drainage was secured and the openings were flushed out with sol. hydrarg. bichlor. 1:3000 every hour. The orbital cellulitis increased in severity, and as the lids were very tense a free canthotomy was performed on December 18th. Peroxide of hydrogen was used in connection with the bichloride solution to cleanse the tissues of the orbit. No subsidence of the swelling occurred until the fifth day, when the tissues gradually became less tense and receded. The temperature ranged from 99° F. to 103.2° F., reaching the normal December 25th.

Examination of the accessory sinuses failed to reveal any pathological condition. December 29th at 3 P.M. the patient had a sudden rise of temperature, which at six o'clock reached 102.2° F. Severe cephalalgia was experienced. Pulse and respiration

almost normal. At 5.30 o'clock patient passed into a state of coma and died at 8.18 o'clock.

Except occasional occipital headache and slight rigidity of the posterior cervical muscles, no symptoms of cerebral disease were manifest. On post-mortem examination a small abscess was found in the anterior, lower portion of the left frontal lobe of the brain, which communicated with the subarachnoid space by a minute opening in the floor of the abscess, and also communicated with the left lateral ventricle, the former opening being apparently old, the latter recent; the abscess presented a well-formed "pyogenic" membrane; it had evidently existed some weeks at least; there was some leptomeningitis on the right side of the brain, the dura mater was intact, and there was no evidence of caries of the orbital walls or other bone tissue. Examination of the pus from the orbital tissue in the early stage of the disease and of the pus from the brain abscess disclosed the presence of streptococci and other bacteria. On account of the apparent age of the abscess and the lack of evidence of infections from other sources, Dr. Weeks was of the opinion that the orbital cellulitis was secondary to the abscess of the brain.

Dr. POOLEY thought that a thrombosis of the orbital vein might have caused the cellulitis.

Dr. MEIERHOF was of the opinion that the infection started from the ethmoidal sinuses.

Dr. WEEKS closed the discussion by stating that phlebitis or venous thrombosis might have caused the abscess.

Dr. DENIG read a report of the history of **a case of traumatic retrobulbar blood-cyst,** situated above and behind the lachrymal gland, being pear-shaped. There was a history of injury to the left orbital wall in a duel ten years ago. Dr. Lange performed a Krönlein operation and removed the cyst.

Dr. WOLFF presented a case with a **peculiar opacity in the vitreous** of both eyes. The opacities are irregular in shape and lie in the visual line, probably congenital. R V = $\frac{1}{3}$. L V = $\frac{1}{2}$. Presented for opinion as to nature of opacities.

Drs. CALLAN and POOLEY considered it a case presenting persistent hyaloid artery.

Dr. BEAMAN DOUGLASS read a paper entitled **Emphysema of the Upper Lid.**

He stated that emphysema of the lid interests the rhinologist only when it occurs from nasal causes. It was the author's pur-

pose not to deal with emphysema the result of fracture of the nasal bone or those cases occurring after operations on the lachrymal ducts, but purely with those cases concerned with ethmoidal causes.

The first case cited was one which had been operated on for ethmoiditis. The patient afterwards blew his nose, with immediate emphysema of the upper lid. This was very probably a fracture of the orbital plate of the ethmoid bone. The next case occurred without operation, a marked emphysema taking place after an attempt to blow the nose. In this case all parts except the ethmoids could be excluded as causative agents. This last case shows that air may escape through the ethmoidal cells into the orbit during the operation of blowing the nose, though the ethmoid cells are not actively pathological. From a medico-legal standpoint this is an important case, because it shows that such a condition may occur and may be recovered from without being caused in any way by operation.

Another patient presented emphysema of the upper lid similar to the last-mentioned case. It came on without cause after blowing the nose, and at the time it was seen, could be increased at will by increasing the nasal pressure. This case shows that emphysema can result from ordinary blowing of the nose, and thus emphysema may occur during an operation from such causes as were sufficient to produce it in this case, and yet the operating surgeon could not be blamed for its occurrence.

From this and other cases cited the author concludes that the condition is not one of grave danger, unless sepsis follows. It must be borne in mind that there is a possibility of sepsis which may result in cellulitis and possibly lead to destruction of the eye.

He also concluded that emphysema may be a wound accident, and when it is, the operating surgeon is not to be held responsible for its production, since there is conceded to be marked variation in the depth of the ethmoid cells, and there is no way by which their depth can be determined by either external or internal examination. He therefore exempts the surgeon for the occurrence of such an accident, and advises, in operations upon the ethmoid cells, that the middle turbinated should be left intact, and that the operating surgeon should work as near the middle turbinated and the side of the cells as possible, this bringing him out at the farthest point from the orbital plate from which it will be possible

to open the cells. After the cells have been opened, the middle turbinated may be amputated, and it is by far the most important guide in the ethmoid operation which we have, since it marks the inner boundary of the cells.

He condemned the use of the curette, since it is more liable to produce traumatism of the orbital plate and subsequent emphysema, and recommends the use of the alligator forceps instead.

Dr. SCHWARTZSCHILD was of the opinion that injury to the tear duct will not produce emphysema of lid, but if it occurs during an operation upon the nose it is due to a direct injury to the cells.

Dr. CALLAN stated that he has seen the lower lid filled with fluid, following the slitting of the canaliculus and cleansing the sac, but he has never seen any emphysema follow such cases.

Dr. WEEKS stated that in order to have air enter the tissue of the orbit or lids, the peri-orbitum must be pierced. In the majority of cases the emphysema was due to perforation of the anterior portion of the lateral wall of the ethmoid cells. In aged people the os planum of the ethmoid and the lachrymal bone often become partly absorbed, rendering it more easy for air to enter the tissues of the orbit and of the lids. He had never seen any emphysema of lids as a result of the ordinary operations upon the lachrymal canal or sac.

II.—MEETING OF FEBRUARY 18, 1901.

Dr. R. G. REESE presented two patients, both men, with **retinitis proliferans.** One had a hemorrhage into the vitreous, and the other combined retinitis striata and retinitis proliferans. The latter was receiving anti-syphilitic treatment and had shown slight improvement. Suggestions as to treatment were desired.

Dr. WEEKS stated that he considered retinitis striata and retinitis proliferans in the same category on account of the close relations. He gave Manz's classification as to causes, viz.: 1. Congenital, obscure, probably syphilis. 2. Syphilis. 3. Traumatism. The first and third were due to hemorrhages. The danger in these cases was the possibility of detachment of the retina due to the contractions of the membranes following at a later period.

Dr. E. GRUENING presented a specimen of a case with **cystic formation on the eyeball.** He stated that the patient was a young girl, aged fourteen years, whose eye had been removed for

cosmetic purposes, the eye being blind. The cyst was sausage-shaped and covered four-fifths of the cornea, the lower one-fifth being free. It was formed between the ligamentum pectinatum and the thinned sclera, Descemet's membrane and the iris not being involved in the formation. It resembled a ciliary staphyloma, but was not connected with the anterior or posterior chamber. It was similar to a case described by Eversbusch. The history of the case was that she had had sore eyes, and had an iridectomy performed by Dr. Weeks two years ago. Later the eye became blind, the cyst was formed, and the eye was enucleated by Dr. Gruening.

Dr. WEEKS stated that when he operated upon the eye, no cyst was present, and that the iridectomy had been performed to prevent staphyloma, as the tension of the eye was increased at that time.

Dr. ARNOLD KNAPP presented a case in which **blindness followed an operation for empyema of the frontal sinus.** The patient, fifty years old, had had five attacks of manifest empyema of the right frontal sinus, following the grippe, in five months. When seen, the upper eyelid was swollen and œdematous, the lower part of the frontal sinus was enlarged, and the bony walls were very tender. Eye normal. Nose, anterior extremity right middle turbinal hypertrophied and bathed in pus. The anterior extremity of the middle turbinal was removed, and two days later the sinus was operated on according to Kuhnt's method; the entire anterior and inferior wall removed. A perforation existed at inner third of junction of anterior and inferior walls. The ethmoid cells seemed normal and only the infundibular cells were eradicated in making a broad communication with nose. The periosteum of the orbit lining the inferior wall was found very much thickened and inflamed. The anterior wall was restored by uniting the periosteo-cutaneous flaps; the lower was left open to admit the packing. On the following day she had some pain. Temperature 100° F. On second day dressing was changed; some œdema of upper lid, and slight exophthalmos. Wound clean; on raising lid patient exclaimed that she could not see. The pupil was fixed and semi-dilated; the ophthalmoscope revealed a condition similar to an embolic process; the retina was hazy and œdematous; arteries very small, and at one point the inferior temporal artery appeared obliterated; no swelling of the disc. Three small hemorrhages were about the macula.

The œdema of the retina gradually disappeared, the hemorrhages were absorbed, the disc went on to simple atrophy, and patient remained blind. The frontal sinus wound did perfectly well and healed promptly with practically no deformity.

Dr. E. GRUENING stated that Jansen's method drains the orbit better than Kuhnt's method, and that if it had been performed in this case a better result might have been obtained. He preferred the former operation.

Dr. TANSLEY inquired whether the blindnesss could not have been produced by some nervous cause. Dr. KNAPP thought it improbable.

Dr. MEIERHOF stated that he thought it was produced by a secondary orbital cellulitis.

Dr. WEEKS inquired whether eye had been subjected to undue pressure during operation, and stated that it was a well known fact that continuous pressure upon an eye for a time will destroy the retinal ganglion cells.

Dr. J. M. MILLS presented a **case showing total removal of upper lid for tumors.** The case was that of a woman who had been presented to the Section at a previous meeting, with a tumor of the upper lid, which was supposed to be an adenoma of the Meibomian glands. The tumor had been removed by an operation; at which time he had hoped to save enough of the eyelid to be able to perform a blepharo-plastic operation later; but the entire tissue was too much infiltrated with nodules to save any of it. As the microscopical section later had shown it to be a carcinoma, he thought it advisable to remove the eye with all involved tissues.

Dr. A. KNAPP stated that the specimen had shown the characteristics of a glandular carcinoma; and that Dr. Mills neglected to state that the preauricular glands were involved.

Dr. HOLDEN stated that the specimen was undoubtedly that of a carcinoma; but that he thought the previous specimen looked glandular.

Dr. WEEKS presented a **case of congenital ptosis.** He had performed a Panas operation upon the lid. He stated that he found that it required three months to reach the maximum effect, and that care must be exercised not to make it too extensive at first, as it increases later.

Dr. A. KNAPP stated that he had performed the operation in one case, and found that the immediate result diminished after

operation instead of increasing. He asked Dr. Weeks how he gauged the effect. Dr. Weeks stated that he knew of no rule, and that we were obliged to rely on our own judgment.

Dr. TANSLEY stated that he had operated upon several cases with this method, and found that the immediate effect was diminished.

Dr. WEEKS stated that he had operated upon four cases and that in all cases the immediate effect had increased later.

Dr. H. W. WOOTTON read a paper on **some advancement operations without tenotomies,** which appears in full in this number.

Discussion—Dr. DUANE stated that he agreed with Dr. Wootton in doing bilateral advancements, of both interni or externi, rather than tenotomy of one muscle and advancement of the opponent; the former disturbs the physiological muscle balance less. Internal strabismus is not only an excess of convergence, but also a deficiency of divergent power. He thought that in divergent strabismus the excess of divergent power was secondary in importance to the deficient convergent power, which should be remedied by advancement of interni.

Dr. FOSTER stated that his experience was confined to those of divergent squint. He had advanced both interni without tenotomizing the externi with a good result. He found that the rotation of the eyes was better after these operations than in any other method tried by him.

Dr. HEPBURN described a case of convergent squint which had been operated upon four times by the old method with very little effect. By advancing both externi in one operation a good result was obtained. He considers it a smooth operation, as it leaves no bunches of tissue.

Dr. VALK stated that he wished Dr. Wootton had given the indications for his method, and not left it to be inferred that it applies to all cases. In a convergent squint with an amblyopic eye he shortens the external rectus and tenotomizes internal rectus. He thought Dr. Wootton's method applicable to those cases with good vision in both eyes.

Dr. MITTENDORF stated that in all simple cases of squint, bilateral tenotomies gave the best result. Where squint was confined to one eye, he preferred advancement and tenotomy of muscles.

Dr. DAVIS stated that squint is always binocular and not mon-

ocular, and that that fact was often forgotten. He stated that both eyes should be operated upon; and prefers Panas's operation to all others. He thought that you can get good effect on short muscles by stretching them.

Dr. GRUENING stated that he prefers the method of simple tenotomies; and advancement in those cases requiring it.

In closing the discussion, Dr. WOOTTON stated that he preferred doing advancements in cases where the vision is good in both eyes, rather than tenotomies. He does not believe that we get an over-effect. He takes the field of fixation before operating. In convergent cases the extent of outward turning is limited.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE THIRD QUARTER OF THE YEAR 1900.

By Prof. ST. BERNHEIMER, in Vienna; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin;

WITH THE ASSISTANCE OF

Dr. G. Abelsdorff, Berlin; Prof. E. Berger, Paris; Dr. A. N. Alling, New Haven; Dr. Dalén, Stockholm; Dr. J. Herrnheiser, Prague; Prof. Hirschmann, Charcow; Dr. Krahnstöver, Rome; Dr. P. von Mittelstädt, Metz; Prof. Da Gama Pinto, Lisbon; Dr. C. H. A. Westhoff, Amsterdam; and others.

Translated by Dr. Ward A. Holden.

Sections I.—III. Reviewed by Prof. HORSTMANN.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

378. **Fuchs.** Text-book of ophthalmology, 8th revised edition. Leipsic and Vienna. Franz Deuticke, 1900.

379. **Neustätter, Otto.** Elements of the theory and practice of skiascopy. Munich. J. F. Lehmann, 1900.

380. **Drude, Paul.** Text-book of optics. Leipsic, 1900.

381. **Schirmer, Otto.** Sympathetic ophthalmia. *Graefe-Saemisch*, 2d edition. Leipsic. W. Engelmann, 1900.

382. **Uspensky, Paul.** The ophthalmology of Avicenna. First German translation of the Liber canonis. *Inaug. Dissert.* Berlin, 1900.

383. **Michailowsky, Elias.** The ophthalmology of Avicenna. *Inaug. Dissert.* Berlin, 1900.

384. **Gretschischeff, Xenophon.** The ophthalmology of Ali Abbas (10th century). Translated into German for the first time. *Inaug. Dissert.* Berlin, 1900.

385. **The Utrecht Charitable Eye Hospital.** Forty-first annual report. Utrecht, 1900.

386. **Distler.** Twenty-sixth report of the Stuttgart Charitable Ophthalmic Institute. Stuttgart, 1900.

387. **New York Ophthalmic and Aural Institute.** Dr. H. Knapp, executive surgeon. Thirty-first annual report, for the year ending Sept. 30, 1900.

388. **De Schweinitz.** Ophthalmic memoranda. *Ophth. Record*, Aug., 1900.

The appearance of an eighth edition of FUCHS's (378) textbook, first published in 1889, is the best evidence of its value. The new edition is considerably enlarged and improved. Recent bacteriological investigations have received special attention, and many new illustrations, particularly of the normal and pathological anatomy of the eye, add to the lucidity of the text.

SCHIRMER (381) has treated the subject of sympathetic ophthalmia in an exhaustive way in the second edition of Graefe-Saemisch. Since this work is the most complete yet written on the subject, it is a valuable contribution to the literature of ophthalmology.

USPENSKY'S (382) dissertation is a continuation of that of J. Cueva, who in 1899 undertook the translation of a part of the book by Avicenna, the famous Arabian physician. The portion now presented continues with the diseases of the eye.

MICHAILOWSKY'S (383) dissertation is a continuation of the foregoing.

Ali Abbas was the most conspicuous of the Arabian physicians of the 10th century. His work, *El Maliki* (the royal book), is one of the most important expositions of Arabic medicine, being a systematically arranged system of the entire theoretical and practical medicine. GRETSCHISCHEFF (384) has translated chapters treating of the anatomy and physiology of the eye and of the special pathology of eye diseases, therapy being omitted.

In DISTLER'S (386) eye clinic at Stuttgart, 1089 eye patients were treated in 1899. There were performed 252 major operations, 60 of these being for cataract, and 45 being iridectomies; 15 for glaucoma.

The annual report of the New York Ophthalmic and Aural Institute (387) shows that the number of new patients treated in the hospital was 547 and in the dispensary 12,381, making a total of 12,928. These figures fully maintain the record of the Institute.

The operations performed (omitting minor ones) were 1159, of which 122 were cataract extractions. The programme of the School of Ophthalmology and Otology is incorporated in the report.

De Schweinitz (388) reports four cases: 1. Retinal detachment, cured by rest, atropine, pilocarpine, sodium silicylate. Patient, a woman, age thirty, had noticed blurred vision for some weeks. No history of traumatism to the eye. She was myopic. After three days' treatment the retina returned to its place. Later a white line, bordered by dark stripes, was seen extending downwards and inwards from the macula. On each side of this the choroid was atrophied. He is disposed to believe that some cases of retinal striations are the remains of cured retinal detachment. 2. Foreign body quiescent in choroid for 18 years, then iridocyclitis; success of localization by X-ray. 3. He used sterile salt solution in a collapsed eyeball after loss of vitreous in cataract extraction, as has been recommended by Dr. Knapp. After four months $V = \frac{20}{XL}$. 4. A case of cure of sympathetic ophthalmia. The disease in the second eye took the form of papillitis and serous iritis. Three and a half years have elapsed since recovery. A. Alling.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

389. **Langendorff.** On the nature of the ciliary ganglion. *Klin. Monatsbl. f. Augenheilk.*, xxxviii., p. 107.

390. **Sigrist.** The danger to the eye and to life from ligation of the carotids. *Graefe's Archiv*, l., 3., p. 311.

391. **Hugland.** On the presence of the diplococcus intracellularis meningitidis (Weichselbaum) in the eye. *Klin. Monatsbl. f. Augenheilk*, Supplement, No. 72.

392. **Merz.** Experimental investigations on the genesis of choked disc. *Arch. f. Augenheilk.*, xli., p. 325.

393. **Purtscher.** The action of illuminating gas upon the organ of vision. *Centralbl. f. prakt. Augenheilk.*, xxv., p. 225.

394. **Chalupecky.** On chromatopsia. A clinical study. *Zeitschr. der tschechischen Aerzte*, 1900, No. 13–23.

395. **Scott, Kenneth.** Eye disease in Egypt. *Lancet*, Aug. 25, 1900.

396. **Herbst.** The cervical sympathetic. An anatomical and surgical study. *Thèse de Paris*, 1900.

397. **Glauning.** On the treatment of infected perforating wounds of the eye. *Münch. med. Wochenschr.*, 1900, No. 31.

398. **Peters.** On the intraocular use of the galvano-cautery. *Ophth. Klinik*, 1900, No. 87.

399. **Druault.** The paradoxical action of section of the optic nerve upon the degeneration of the retinal ganglion cells caused by quinine. *Arch. d'opht.*, xx., 7, p. 390.

400. **Touche.** A brain of a person with one eye. *Bull. de la soc. anatom. de Paris.*, June 1, 1900.

401. **Phillips, A.,** and **Yonge, E. S.** A case of acute phagedæna of the nose, eye, and face, occurring in a syphilitic subject. *The Practitioner*, June, 1900.

402. **Benson, Arthur.** Congenital polycoria in both eyes. *Royal Academy of Medicine in Ireland, Section of Pathology*, March, 1900.

403. **Lauder, Brunton T.** The face and pupil in alcoholic neuritis. *Brit. Med. Jour.*, Dec. 1, 1900.

404. **Buchanan, Leslie.** A case of microphthalmos with cystic development. *Ophth. Review*, Nov., 1900.

405. **Vaughan, P. T.** Some observations upon syphilitic manifestations in the optic nerve and retina; inflammatory manifestations. *N. Y. Med. Jour.*, Sept. 29, and Oct. 6, 1900.

406. **Bull, C. S.** Tuberculosis of the eye; its differential diagnosis, pathology, and treatment. *Med. Record*, Dec. 8, 1900.

407. **Libby, G. F.** Monocular blindness of 50 years' duration. *Ophth. Record*, Nov., 1900.

408. **Posey, W. C.** Mental disturbances after operations upon the eye. *Phil. Med. Journ.*, Sept. 15, 1900.

LANGENDORFF (389) concludes that the cells of the ciliary ganglion are of a sympathetic nature, at least in the cat, and in all probability also in the dog, monkey, and man.

AS SIGRIST (390) shows, ligation of the common carotid does not appear to endanger the organ of vision in healthy persons in a physiological way, since the slight anæmia of the retina, diminution in tension, and change in the size of the pupil soon pass off. In the cases in which permanent disturbances have resulted, they were due to extraordinary pathological conditions, infection, injury of the sympathetic during the operation, and to pathological processes in the brain and the cerebral vessels. In a case of blindness following ligation of the common carotid for carcinoma of the tongue, which Sigrist examined, he found the characteristic picture of embolism of the central artery of the retina. In the operation a bit of the thrombus formed after the provisional ligation became detached and was carried into the central artery. Both centrally and peripherally from this primary embolus other thrombotic masses were deposited in the course of a few days.

This was confirmed by the microscopic examination, and Sigrist found that the cloudiness of the retina following embolism was due to an œdema of the nerve-fibre layer and of the layer of cone fibres in the macular region.

In another case the external and internal carotid were ligated on account of a left pulsating exophthalmus. Here also the picture of embolism of the central artery appeared in the left eye. The embolus or thrombus doubtless arose from coagulæ in the arterio-venous aneurism or from a thrombus of the internal carotid ascending from the point of ligation.

Thus the observations that have been made of disturbances of the organ of vision after ligation of the carotid do not support the idea that the simple interruption of the arterial circulation in the carotid can particularly affect the eye of that side.

The last part of the paper treats of the danger to life from ligating the carotid, with special reference to pulsating exophthalmus. Advanced age *per se* does not affect the prognosis if the patient's general condition is good.

Ligation for pulsating exophthalmus should always be preceded by a systematically carried out compression in order to accustom the heart to the increased labor and to favor the development of collateral circulation.

In the conjunctival secretion of a boy of five months with a severe conjunctivitis and ulceration of the cornea, HUGLAND (391) found a micro-organism which was identical with the diplococcus intracellularis meningitidis of Weichselbaum and Jaeger, found by them in the cerebro-spinal fluid of epidemic meningitis.

MERZ (392) is convinced from the results of a series of experiments on dogs and rabbits that an increased intracranial pressure alone is sufficient to cause choked disc. It is only necessary that this pressure be maintained uninterruptedly for a certain time. A transient increased pressure, even if frequently repeated, leads only to venous hyperæmia and arterial anæmia of the fundus. Choked disc may be produced by a slight increase in pressure, but the higher the pressure the more quickly do the successive changes in the fundus follow. The eye of the rabbit and that of the dog react to the increased pressure somewhat differently, choked disc arising much more readily in the dog. The first evidence in the eye of increased intracranial pressure is a dilatation of the retinal veins, followed later by a constriction of the arteries.

Probably many factors have an influence in producing this experimental choked disc. In consequence of the increased pressure the venous sinuses of the brain are compressed, and notwithstanding the existence of anastomoses between the oph-

thalmic vein and the anterior facial vein, the disturbance in the outflow of blood through the ophthalmic vein must in the beginning have its effect on the circulation in the eye. Furthermore, there is a blocking up of liquid in the subvaginal space which compresses the vessels from the point where they pass through the sheaths of the nerve to the point where the optic nerve enters the eyeball. Finally, in consequence of the compression of the nerve, its lymph circulation is disturbed and the œdema of the nerve fibres begins, which in its turn increases the compression of the vessels. Such a disturbance of the blood and lymph circulation leads after a time to inflammatory symptoms in the nerves, their sheaths, and the optic discs. Because of the similarity in anatomical structure between the eye of the dog and that of man, the results of these experiments may with considerable certainty be supposed to hold good for the human eye.

PURTSCHER (393) describes a case of poisoning with illuminating gas. At first the patient was totally blind. Six weeks later $V = \frac{1}{4}$, and the fundus was almost normal. Two months later vision had risen to $\frac{3}{4}$, but the left halves of the fields were wanting and also the lower half of the right eye. This condition remained. Purtscher believes that there had been hemorrhages or foci of softening in the optic radiations, or perhaps in the cortex itself, which had caused these disturbances of vision.

From a study of cases of his own and others from Professor Schöbl's clinic and a careful consideration of the literature of the subject, CHALUPECKY (394) comes to the following conclusions in regard to the chromatopsias:

The various pathological subjective color perceptions are not brought about by the excitation of any hypothetical centre for color perception, but they depend upon different causes, which are:

1. General diseases in which the colored vision has in part an anatomical basis, as in icterus. In other cases there is no such basis, or it is as yet unknown. Diseases causing great weakness lead to a disturbance of adaptation of the retina in consequence of poor nutrition. In this group are the nervous affections, such as the various forms of hysteria, epilepsy, and migraine. The central changes, which probably affect chiefly the vessels, cause a disturbance in the activity of the peripheral terminations of the sense organs.

2. Closely related to these are the cases of poisoning. Here again there is an alteration in the excitability of the nerve-endings

through the direct action of the poison, and also various disturbances of adaptation in consequence of abnormal conditions of the retinal pigment.

3. Diseases of the fundus, particularly of the retina, cause either colored scotomata or chromatopsias, which cover the entire field of vision in the form of a mist or an appearance of colored light and veil the objects looked at.

4. Dilatation of the pupil, formerly regarded as an essential condition, is merely a secondary cause and a factor in producing the effect of glare in consequence of the insufficient restoration of visual substance.

5. The effect of glare, which is an excessive, sudden breaking down of visual substance in the retina, can lead to chromatopsias in eyes predisposed by myopia, deficient pigmentation, over-fatigue, etc.

It is particularly the ultra-violet rays which are present in great quantity in the atmosphere after reflection from sand or water. They are the cause of the frequent chromatopsias after removal of the lens, for the lens normally absorbs them and prevents their entrance into the eye. HERRNHEISER.

KENNETH SCOTT (395) presents detailed statistics in regard to 5358 cases of eye disease which he treated in Egypt in the course of 8 years. From May to October, the hot season, the acute and infectious forms of eye disease increase greatly. The usual view that flies play an important rôle in the transmission of diseases is not held by the author, since the flies rarely come in contact with the conjunctival sac. Among the poorer classes, pastes containing sugar, or alum, or cayenne pepper are frequently used as eye remedies and not rarely lead to extensive ulceration of the conjunctiva and sometimes to symblepharon.

ABELSDORFF.

HERBST'S (396) paper gives a résumé of all the reported cases of extirpation of the superior cervical ganglion and adds several new observations. For chronic, hemorrhagic, and absolute glaucoma, the operation has been done in 40 cases (11 by the author), and death followed in 10 cases, in 4 of which this result had no connection with the operation. A cure was obtained in 6 and improvement in 18. In the other cases symptoms of tachycardia or exophthalmus developed.

The operation was done by various French surgeons for Basedow's disease, and sometimes improved the condition of the

patient, although there was never a complete cure. The results obtained when the operation was done for epilepsy were not encouraging. BERGER.

GLAUNING (397) advises in cases of infected wounds of the ball the galvano-caustic paracentesis of the anterior chamber.

After dividing the optic nerve behind the entrance of the central vessels, the ganglion cells of the retina atrophy in the course of 10–20 days. The same happens—only more quickly—after a toxic subcutaneous injection of quinine. DRUAULT (399) found that when quinine was injected after division of the nerve the changes in the ganglion cells were much less marked. The author believes that after neurectomy the retina loses its susceptibility to quinine poisoning. V. MITTELSTÄDT.

TOUCHE (400) describes the changes found in both occipital lobes of a patient whose left eye had been enucleated 3 years before his death. BERGER.

The patient of PHILLIPS and YONGE (401) was a soldier, aged twenty-six, who when first seen had an ulcer on the roof of his mouth about $\frac{3}{4}$ of an inch in diameter. He was an alcoholic subject and had suffered from syphilis 2 years previously in India, for which he had undergone a short course of treatment. There were signs of phthisis in the right lung.

The ulcer spread rapidly, but was arrested by the application of nitric acid. Forty-eight hours later he had phagedæna of the nose and in a week all the soft parts of the nose had necrosed. The right eye, the lower lid, and the skin over the malar bone were one huge ulcer. In spite of treatment, it spread and implicated the left side of the face and left eye. The patient died of septic poisoning one month after the commencement of the disease.

Neither general nor local treatment had any effect except on the ulcer of the mouth. The patient was under no bad hygienic conditions such as are usually associated with this disease, and the authors consider that the vitality was so greatly lowered by the combination of alcohol, syphilis, and tubercle that his system was incapable of withstanding the infection. MARSHALL.

BENSON'S (402) patient shown was a man, aged forty. In the right eye there were, in addition to the normal pupil, 8 other openings in the iris. In the left iris one extra opening existed. They were for the most part slit-like openings, through which the fundus could be illuminated. The patient was suffering from chronic glaucoma. MARSHALL.

LAUDER BRUNTON (403), in a short paper on alcoholic neuritis, draws attention to a mask-like and expressionless appearance, due to the fact that although the lips and eyelids move freely, yet the skin between the two is motionless and unwrinkled. He has also noticed that the pupil reflex is just the reverse of the Argyll-Robertson phenomenon.

The reflex of the pupil to light is rapid and extensive, but contraction on accommodation is sluggish and slight or entirely wanting. In one or two cases he has observed a dilatation instead of a contraction on accommodation. MARSHALL.

BUCHANAN'S (404) case described is that of an infant, three months old. On examination, the upper lid of the right eye was distended by a growth in the orbit of a reddish color, covered with thickened conjunctiva. The lower lid was pushed downwards, and when it was considerably depressed a very small cornea was seen at the lower and outer part of the tumor. The mass was removed and was found to consist of 3 parts, the eye, the cyst, and the pedicle. The eye was very badly developed, the iris had no pupil in it, while the lens lay almost entirely in the cyst. The cyst was composed of dense tissue and tapered back to the pedicle. The pedicle was solid and contained one or two minute cystic formations. From it there passed forwards into the cyst a convoluted mass, which was really the retina.

MARSHALL.

There was an apparently convincing history of blindness to the degree of light perception in the case of LIBBY (407), with the discovery that the vision was restored after an attack of crossed hemiplegia. In the absence of organic changes, he regards the blindness as psychical. ALLING.

POSEY (408) presents 24 cases of delirium from his practice and from the records of the Wills Eye Hospital. The derangement in all cases began as a mild restlessness and rapidly developed into active delirium. Most of the cases occurred on the second or third day after operation. Recovery was always complete. After critical study of the various theories, he is of the opinion that the cause is largely psychic, and agrees with Parinaud that the delirium is due to preoccupation of patients prior to and after operation. The condition of suppressed excitement and the realization that the suspense is over must occasion psychical disturbances. ALLING.

III.—INSTRUMENTS AND REMEDIES.

409. **Wolffberg.** Dionin and its therapeutic application. *Therap. Monatsbl.*, xvi., No. 31.

410. **Luciani.** Itrol in the treatment of blennorrhagic conjunctivitis of adults and the new-born and of blennorrhoic conjunctivitis of the new-born. *Ann. di Ottalm.*, xxix., 4, p. 457.

411. **Singer.** Brucin and its effect on the normal eye. *Graefe's Archiv*, l., p. 665.

412. **Neustätter.** Validol in scotoma scintillans. *Ophth. Klinik*, No. 12, 1900.

413. **Klietsch.** On the use of suprarenin in ophthalmology. *Inaug. Dissert.*, Halle, 1900.

414. **Berger.** Simple binocular loupe and stereoscopic spectacles. Paris, Schleicher frères, 1900.

415. **Kraemer.** A new ophthalmo-skiascope. *Klin. Monatsbl. f. Augenheilk.*, xxxviii., p. 464.

416. **Seabrook.** Iodine solutions for trachoma. *N. Y. Eye and Ear Inf. Reports*, viii., 1900.

417. **Howe.** A convenient head-rest for ophthalmological examinations. *Amer. Journ. of Ophth.*, June, 1900.

418. **Stephenson, Sydney.** Unusual result of applying homatropine to the eyes. *Ophth. Review*, Aug., 1900.

419. **Wood, Casey A.** Massage of the eyeball. *Journ. Amer. Med. Assoc.*, Nov. 17, 1900.

420. **Ellett.** The relative value of homatropine as a cycloplegic. A clinical study. *Ibid.*, Sept. 15, 1900.

421. **Hotz.** A few observations on the efficacy of protargol in pyogenic affections of the eye. *Ibid.*, Aug. 25, 1900.

WOLFFBERG (409) reports the favorable action of dionin in cases of injury of the cornea, and in the after-treatment of cataract patients.

LUCIANI (410) highly commends itrol, which has always given him excellent results in blennorrhœa. It does not irritate, is but slightly painful, and does not injure the cornea. Only fresh solutions (1:4000) are to be used and they must be protected from the light and air. KRAHNSTÖVER.

NEUSTÄTTER (412) used validol (menthol valerianate) in five cases of scotoma scintillans with good result.

According to KLIETSCH (413) suprarenin is an astringent that when instilled into the conjunctival sac produces an anæmia of the palpebral and bulbar conjunctiva, but does not affect the deeper-lying vessels of the episcleral tissue, the uveal tract, or the retina. It has no value in the treatment of keratitis and pannus. Its effect is solely upon the superficial vessels of the

conjunctiva. At first it often causes considerable burning. It has a certain value in operations, since it prevents bleeding. Its action is so transitory and superficial that it does not influence the course of a disease.

BERGER (414) speaks of the theory of his stereoscopic loupes and spectacles and reports the results among those who had previously worked with a single loupe—in microscopy, Prof. Ramon y Cajal; in ophthalmology, Nicati, Truc, v. Sicherer; and others in other occupations. His paper is at the same time a protest against the numerous erroneous and extravagant representations of the daily press. BERGER.

From a rather extended experience in the treatment of trachoma, SEABROOK (416) is satisfied that a 2 % solution of iodine in benzoinol, applied once a day, is an excellent remedy. BURNETT.

HOWE (417) figures and describes a very convenient headrest, which consists, chiefly, of a stationary mouthpiece, on which the teeth are to be firmly fixed, and a movable forehead rest which can be adjusted to any size and shape of face, the whole to be fastened to a table and placed at any required height. BURNETT.

STEPHENSON (418) finds that in children there is on an average one case of marked atropine poisoning in 300, although there are many which show slight signs, such as flushing of the skin and dryness of the throat.

The case here recorded is that of a girl, aged three years, suffering from trachoma, with pannus. She had homatropine drops used 9 times in 90 minutes.

About 3 hours later the child was strange in her manner and speech. She failed to recognize familiar faces and picked at the bedclothes. Her face was flushed and her lips and tongue parched, but there was no eruption. Temperature, 98.4° F. The symptoms quite passed off in 24 hours. MARSHALL.

In the experience of WOOD (419), massage of the eye with the tips of the fingers, after the instillation of oil or ointment, has proved beneficial in chronic diseases of the conjunctiva, ulcer of the cornea, glaucoma, and retinal embolism. It is counterindicated in acute conjunctivitis and keratitis, as well as in diseases of deeper structures of the eye. ALLING.

HOTZ (421) finds protargol highly satisfactory as a substitute

for nitrate of silver, since it causes little reaction and has no caustic effect. In gonorrhœal conjunctivitis, dacryocystitis, and suppurative keratitis it is a most valuable remedy. In acute pyogenic affections, he uses not less than 20 %, applied with a cotton swab twice in 24 hours. A. ALLING.

Sections IV.–VII. Reviewed by PROF. ST. BERNHEIMER, Innsbruck.

IV.—ANATOMY.

422. **Bernheimer.** Anatomical and experimental investigations on the cortical visual centres. Read at the International Medical Congress in Paris. Reviewed in *Klin. Monatsbl. f. Augenheilk.*, xxxviii., p. 541.

BERNHEIMER (422) has studied the cortical centres of vision in the brains of new-born and young infants by the method of following the development of the medullary sheaths, and experimentally in a great number of monkeys by Marchi's and Nissl's methods.

All the convolutions of the occipital lobe, from the apex to the angular gyrus, lateral and medial, are more or less richly supplied with fibres of the optic radiations. The convolutions of the medial surface (cuneus, calcarine fissure, etc.) are the ones which chiefly receive the fibres of the main ganglion of the external geniculate body; while to the lateral surface of the occipital lobe are distributed the fibres which arise in the pulvinar and the anterior corpora quadrigemina.

All the symptoms which clinically are included under the term psychical blindness are not due to the destruction of particular portions of the visual cortex, but depend upon the extent to which the neurons of the long and short association tracts are destroyed by the experiment or the morbid process.

By his experiments, he finds, in accord with v. Monakow, and opposed to the views of Munk, Wilbrand, Forster, Henschen, and others, that the macular fibres are nowhere present as a compact bundle in the cortex. The terminations of the macular fibres lie, even in the geniculate body, scattered among those of the peripheral fibres. The indirect continuations of both, the fibres of the optic radiations, also end mixed, mostly or altogether, in the medial convolutions above mentioned. Thanks to the rich contact relations of the terminal arborizations of both sorts of fibres to the ganglion cells of the external geniculate body, visual impulses from the macular region may always be conducted to the

cortex so long as fibres of the optic radiations still possess the power of conduction. Thus there has never been seen an isolated cortical macular hemianopsia, nor a hemianopsia with complete loss of central vision.

V.—PHYSIOLOGY.

423. **Guirato.** Experimental researches on the course of the pupil-dilating fibres in the intraorbital nerves. *Ann. di Ottalm.*, xxix., 1, 2.

424. **Sachs, M.** On the relations between the movements of the eyes and those of the head. *Zeitschr. f. Augenheilk.*, iii., p. 287.

425. **Edridge-Green.** Remarks on color blindness and the tests to be adopted for its detection. *Ophth. Review*, Oct., 1900.

426. **Hansell.** Estimation of the amount of injury to the earning capacity of the individual from partial or complete loss of vision. *Annals of Ophth.*, Oct., 1900.

427. **Good, C. A.** The cortical localization of sight and hearing. Report of a case of blindness (slight light perception remaining) and deafness due to cerebral lesions. *Amer. Journ. Med. Sciences*, Dec., 1900.

428. **Allport.** What amount of visual defect should disqualify in railroad service? *Journ. Amer. Med. Assoc.*, Oct. 13, 1900.

429. **Thompson, W.** Improved lantern method of testing color perception. *Ibid.*, Sept. 15, 1900.

430. **Williams, C. H.** Improved lantern for testing color perception. *Ibid.*

431. **Duane.** The effect of converging prisms upon our notions of size and distance. An experimental study. *Ophth. Record*, Dec., 1900.

432. **Lippincott.** The influence of abducting and adducting prisms on the estimation of distances. *Ibid.*, Oct., 1900.

433. **Suter.** The dioptric power of the cornea. *Ibid.*, Apr., 1900.

From a series of experiments on dogs, GUIRATO (423) comes to the following conclusions:

1. Destruction of the ophthalmic ganglion causes great mydriasis, anæsthesia of the cornea and conjunctiva, hypotony of the ball, trophic disturbances, and suppuration of the eye.

2. The same effect is produced by cutting all the short ciliary nerves.

3. The section of the long ciliary nerves alone causes a moderate miosis.

4. If, after section of the long ciliary nerves, the superior cervical ganglion of the sympathetic is destroyed, an excessive miosis results.

5. Electrical stimulation of the long ciliary nerves causes excessive pain and marked mydriasis.

6. Electrical stimulation of the short ciliary nerves causes pain and moderate miosis.

7. Electrical stimulation of the superior cervical ganglion, after section of the long ciliary nerves, widens the pupil moderately.

8. After section of all the ciliary nerves, stimulation of the sympathetic has no longer any influence upon the pupil.

Thus it seems proved that as well in the short ciliary nerves as in the long ciliary nerves of the dog, pupil-dilating fibres run from the cervical sympathetic. KRAHNSTÖVER.

SACHS (424) has carefully studied the relations between movements of the eyes and movements of the head from a clinical standpoint.

He distinguishes optical excitations which cause movements of the head and perhaps also of the body and eyes, alone or combined. All movements of the head or body which take the place of movements of the eye are called vicarious. The vicarious turning of the head is brought about through the excitations caused by the traction of the ball in one direction upon the muscular attachments, which are very rich in nerves. When, during the turning of the head, the continued fixation of an object is desired, compensatory movements of the eye take place in the opposite direction.

The author then discusses the turning of the eyes due to labyrinthine excitation, and finally the abnormal positions of the head maintained to prevent diplopia in cases of muscular paralysis.

EDRIDGE-GREEN (425) states his opinion that Holmgren's test is not reliable, and that a man who is color-blind may fail to be detected by the use of the wools. He speaks strongly in favor of a specially constructed lantern test, to be used in addition to his own classification test. He considers that color is conveyed to the mind through a perceptive centre, and that this centre is only able to distinguish six definite points of difference (colors) in the spectrum. Therefore, for normal sight, he holds a hexachromatic theory of color-vision which is independent of light and shade.

He believes that light acting upon the retina liberates the visual-purple from the rods and a photograph is formed, the cones conveying the impression of the photograph to the brain, the cones being sensitive to chemical changes in the visual substance but, like the optic-nerve fibres, not to light itself. MARSHALL.

HANSELL (426) fully discusses this complicated problem. His conclusions are: Blindness is that degree of loss of vision which incapacitates one from earning his living in any occupation requir-

ing sight—the degree varying with the occupation. Vision of less than one half diminishes the earning power, and the less the vision the greater the loss of earning power. Monocular blindness is not incompatible with full earning capacity. Monocular blindness, with weak sight in the remaining eye, rapidly diminishes the earning power. He presents a table in which he computes the earning power with different degrees of disability. ALLING.

GOOD'S (427) patient, a woman aged fifty-five, gave a history of several attacks of paralysis, following which she became blind, except for light perception, and totally deaf. While under observation she suffered from convulsive seizures at irregular intervals, usually on the right side. She died from exhaustion. In the left hemisphere of the brain a large cyst was found, opening at the apex of the occipital lobe and communicating by a large opening with the lateral ventricle. This was evidently the remains of an old embolus of the posterior cerebral artery. It was quite apparent that the optic and auditory radiations were entirely destroyed. In the right hemisphere also the cortex of the occipital lobe, both on the mesial and convex surface, was cut off from the rest of the brain as the result of a lesion of the same character. Under microscopical examination, the parts of the occipital lobes which remained were studied with reference to the question whether they were still in connection with the lower part of the brain. The right angular gyrus was the only part which escaped complete degeneration. The left geniculate bodies showed very marked degeneration, but the right internal geniculate was better preserved. Both corpora quadrigemina also showed degenerative changes, as did the left optic tract.

The right optic tract, however, was better preserved, especially the central fibres. The left optic-nerve fibres had mostly disappeared, but a few remained in the centre. The right was in a better condition.

The central fibres remaining in the left optic nerve, and the better condition of the right optic tract and right geniculate bodies, with the right angular gyrus as the only part of the visual area which escaped destruction, would seem to indicate a connection between the macular region and the angular gyrus of the opposite side. ALLING.

ALLPORT (428) offers the following suggestions: The essential principle is that railroad corporations should require a scientific entrance examination, by a surgeon, of the eyes and ears of

employees concerned in the operation of trains. Two standards should be adopted. The new men should be required to possess perfect color perception and vision $\frac{20}{20}$ in each eye, without glasses. They should hear a whisper at twenty feet. Old employees, however, may pass with $\frac{20}{30}$ or $\frac{20}{40}$ in one eye at least, according to the class of work. As a rule, glasses cannot be worn. Re-examinations should be frequent, especially with users of tobacco or where constitutional disease is known to exist.

ALLING.

In continuing the discussion on the effect of prisms, DUANE (431) maintains, by a series of experiments, that a prism with the base out reduces the size and increases the distance of objects looked at. He regards the explanation as somewhat difficult, but is inclined to think that disturbance of the normal relations between convergence and accommodation is chiefly responsible for the diminution in size, and that the recession is partly due to this cause and partly to contrast and perspective. There is also a psychical element. ALLING.

According to LIPPINCOTT (432) adducting prisms (base out) make objects within twenty feet seem nearer, whereas abducting prisms (base in) make them appear more remote. This is contrary to the observations of Duane and others. ALLING.

SUTER (433) shows that the cornea has no fixed dioptric value, as it can be replaced by a different lens for every variation in the length of the incident pencil. The ophthalmometer is valuable and certain in measuring astigmatism, because the dioptric power of the correcting lens is always equal to the difference between the reciprocals of the anterior focal lengths, whatever be the length of the incident pencil. BURNETT.

VI.—REFRACTION AND ACCOMMODATION.

434. **Hess.** The present status of the doctrine of accommodation. Internat. Med. Congress, Paris, 1900. *Klin. Monatsbl. f. Augenheilk.*, xxxviii.

435. **Köhne.** The operations for myopia at the Tübingen eye clinic. *Inaug. Dissert.*, Tubingen, 1900.

436. **Pflueger.** The diminution of acuteness of vision near by in myopes of high degree. *Report 9th Internat. Med. Congress*, Utrecht, 1899.

437. **Kollock.** The surgical treatment of high myopia, with the report of a case. *Carolina Med. Journ.*, May, 1900.

438. **Hansell.** A study of the changes in refraction in 400 eyes during 7 years. *Ophth. Record*, April, 1900.

HESS (434) in a comprehensive paper describes the present views on accommodation. Referring to his own fundamental studies in this matter, he combats anew Tscherning's objections to the Helmholtz theory, and assembles all the arguments in favor of the Helmholtz theory.

KÖHNE (435) gives a résumé of the operations for myopia performed at the Tübingen clinic.

Although, in general, the results were good, there were two losses among sixty cases, one from infection and one from secondary glaucoma. The operation requires the greatest care in every respect and is not without danger. The Tübingen cases do not allow a definite decision in regard to the progress of the myopia and the chorio-retinitis changes. Detachment of the retina did not take place.

PFLUEGER (436) has reduced his test types to $\frac{1}{10}$ their former size by means of photography. The smallest should be read at a distance of 10 *cm*, corresponding to an acuteness of vision of 1, according to Snellen.

Myopes of high degree, in spite of their larger retinal images, have within the far point vision reduced to $\frac{1}{2}$ or $\frac{1}{3}$. The test is to determine the smallest letters that the myope can make out at the maximum distance, which is measured from the cornea by means of a measure fixed on the chart.

The case reported by KOLLOCK (437) is a boy of 16, V = $\frac{3}{200}$ with — 13 $\frac{1}{10}$ when first seen in 1895. In 1895 the M. had increased to 16 D. Interior of eye healthy. Several discissions on one eye, with subsequent extraction of the lens without iridectomy. No unpleasant symptoms. Without correcting lens, V = $\frac{1}{10}$, with + 1.5 ⊃ + 2.5^c 90° $\frac{1}{10}$. The other eye was subsequently operated on in the same way and with + 4 V = $\frac{1}{20}$.

BURNETT.

As a result of the examination of the changes which have taken place in the eyes of 200 patients after an average space of 7 years, HANSELL (438) concludes that the changes, if the correction is made under a mydriatic, are not considerable. The increase in refraction he finds is greatest in the third decade, a little less in the second. After the 20th year changes were very uncommon. The eyes and the patients were healthy and there were no complications.

BURNETT.

VII.—MUSCLES AND NERVES.

439. **Malboni.** Modifications in the curvature of the cornea, following operations for strabismus. *Ann. di Ottalm.*, xxix., 4.

440. **Margano.** On a case of periodic paralysis of the oculomotor in a hysterical girl with irregular menstruation. *Ibid.*, xxix., 1, 2.

441. **Lagrange.** Stereoscopic exercises in the treatment of strabismus. Value of capsular advancement in insufficiency of convergence. *Bull. de la soc. de méd. et de chirurg. de Bordeaux*, May 11, 1900.

442. **Bielschowsky.** Investigations on the vision of patients with squint. *Graefe's Archiv*, l., 2, p. 406.

443. **Fergus, Freeland.** On the operative treatment of strabismus. Monograph.

444. **Beaumont, W. M.** The external ocular muscles as co-ordinates of accommodation. *The Ophth. Review*, Aug., 1900.

445. **Duane.** Two cases of nystagmus. *Ophth. Record*, Oct., 1900.

446. **Theobald.** A case of transient spastic convergent strabismus. *Johns Hopkins Hosp. Bulletin*, July, 1900.

447. **Fox, L. Webster.** A simple operation for divergent strabismus. *Journ. Amer. Med. Assoc.*, Aug. 25, 1900.

MALBONI (439) after numerous measurements of the corneas of patients operated on for strabismus, comes to the following results:

In 19 cases of simple tenotomy of the internal rectus no change occurred in 7 cases, and in 7 the vertical meridian became more highly curved, varying from 0.2—1.15 D. In 3 of these 7 cases, there was also a flattening of the horizontal meridian from 0.25—0.5 D. In 1 case the curvature of the horizontal meridian diminished 0.4 D, with alteration in the vertical, but six months later this difference had disappeared. In 2 cases the curvature diminished in both meridians. In 2 the observations were uncertain.

In 6 cases in which, besides tenotomy of the internal rectus, capsular advancement of the external was done, the curvature of the cornea remained unchanged in 1, diminished in the horizontal meridian 0.5—1.5 D in 4, and in 3 of these 4 diminished in the vertical meridian also 0.1—0.5 D.

In a case of tenotomy of one external rectus the curvature in the vertical meridian increased 0.5 D. With these changes of curvature there was often a change in the direction of the principal meridians, sometimes amounting to 30°, yet on account of his small material the author does not wish to draw any conclusions as to this point. KRAHNSTÖVER.

MARGANO (440) observed a periodic oculomotor paralysis

over a period of 3 years. The patient was a girl of seventeen, who suffered from attacks of hystero-epilepsy. With her menses all the symptoms of a right oculomotor paralysis appeared, ptosis, turning of the eyes downward and outward, inability to turn them inward, upward, or downward, paralysis of accommodation, photophobia, and severe pain. The attacks lasted 5–7 days and then passed off, recurring about 8 times in the year. Finally, after treatment of the hysteria and regulation of the menses, the attacks ceased.

As regards pathogenesis, the author lays stress upon the hereditary neuropathic disposition which is found in all of the reported cases. In this case the mother was an epileptic and the father alcoholic. KRAHNSTÖVER.

BIELSCHOWSKY (442) has made careful examinations of the vision in a great number of patients with squint.

FERGUS (443) has published a monograph on the operative treatment of strabismus. After going into the question of the different forms of squint he enters carefully into the surgical treatment of each.

He is opposed to tenotomy in nearly every case, and much prefers the operation of advancement.

He finds that most cases are due to insufficiency of one muscle rather than to overaction of the other, and he very rightly draws the conclusion that it is far better to attempt to strengthen the weak muscle than to weaken the strong one to such an extent that it is no longer able to overcome the action of the other.

He objects strongly to tenotomy, as it often leads to divergence as well as to abnormal widening of the inner canthus, sinking of the caruncle, and more or less protrusion of the eyeball. A single, or, more usually, a double advancement cures the squint, strengthens the muscle, and does no harm. MARSHALL.

BEAUMONT (444) has had his attention drawn to the fact that in 127 cases of H of 2 D and less, the vision of the patients even under a mydriatic was different even in individuals with the same refractive error. Although, on the whole, those having a higher error saw worse, yet with 54 patients with 1 D of H he found that

4 could see.....$\frac{6}{6}$
16 .....$\frac{6}{9}$
18.....$\frac{6}{12}$
14.....$\frac{6}{18}$
2.....$\frac{6}{24}$

In all these a lens of 1 D brought the vision to $\frac{6}{6}$ and some to a still higher degree. He therefore concludes that there must be some factor other than accommodation to account for this. Some pupils dilate more with atropine than others, but he found that a diaphragm of 4 *mm*, although it improved all, yet it did not bring the vision of those seeing worse up to anything like those who saw the best. He comes to the conclusion that the external ocular muscles, by pressure on the globe, exercise a corrective power in some cases. "No doubt eyes vary in their power of distinguishing and interpreting the details of small retinal images, still the variation in intelligent people can hardly be so marked as that which is expressed by the difference between the extremes of $\frac{6}{6}$ and $\frac{6}{2\,6}$." The action of the extrinsic muscles probably elongates the visual axis of the eye even in emmetropia, and produces a temporary ectasis. He then discusses the great variation that exists in eyes in the glass which they take to correct the refraction after the removal of the lens for high myopia, and although tables have been prepared by Frost, yet it is found that there is still a considerable variation between the theoretical and practical error of refraction. In conclusion he states "there would seem to be no doubt that the visual acuity of emmetropes, with an equal amount of error and with paralysed accommodation, varies very considerably; but it would seem to be uncertain (1) whether this variation in the acuity is due to a difference in the amount of cycloplegia produced by atropine in different persons, or (2) whether it is due, as I suggest, to differences of tonicity in the external ocular muscles of different individuals, or (3) whether it is due to any other cause." MARSHALL.

The interesting feature of the first case of DUANE (445) is the fact that the patient, while reading, turned the printed page so that the lines ran vertically instead of horizontally. The second case showed periodic vertical nystagmus in the left eye, which appeared soon after confinement. Correction of the refraction caused the nystagmus to cease. ALLING.

THEOBALD (446) relates a case of a girl seven years old, convalescing from influenza, who developed diplopia and convergent strabismus of left eye. No paresis was present. In a few days the squint disappeared. He believes that it was due to a purely spastic condition. ALLING.

FOX (1) divides both external recti muscles, (2) stretches the tissues by inserting hook above and below and rotating eyeball

inwards, (3) excising an elliptical piece of conjunctiva and of Tenon's capsule over the internal rectus, (4) suturing opening thus made. He believes that the results are permanent. ALLING.

Sections VIII.–XII. Reviewed by DR. R. SCHWEIGGER, Berlin.

VIII.—LIDS.

448. **Cirincione.** Elephantiasis of the lids. *La Clinica Ocul.*, March, 1900.

449. **Hillemanns.** On the operation for trichiasis. *Centralbl. f. prakt. Augenheilk.*, xxiv., p. 264.

450. **Neuschüler.** On plastic operations on the lids. *Ann. di Ottalm.*, xxix., p. 3.

451. **Van Duyse.** Pathogenesis of retropalpebral colobomatous cysts. *Arch. d'opht.*, xx., 7, p. 358.

452. **Lassar.** Carcinomatous tumor of the lid in xeroderma pigmentosum. *Deutsche med. Wochenschr.*, 1900, No. 28.

453. **Rohmer.** Symmetrical angiomegaly in the upper lids. *Arch. d'opht.*, xx., 8, p. 407.

454. **Snéguirew.** Neurofibroma of the skin of the lid and the head. *Ibid.*, No. 7, p. 375.

455. **Herbert, H.** The wedge operation for trichiasis and entropion. *Lancet*, Nov. 3, 1900.

CIRINCIONE (448) reports 5 cases of true elephantiasis of the lids. A distinguishing feature of the true variety is that at least two lids are involved, and generally four, as is easily explained from the etiology, the cause being repeated attacks of erysipelas, which usually are not even confined to the lids alone, but involve the entire face. Anatomically the swelling consists of a proliferation of fibrous connective tissue arising from various small foci which surround the vessels. The author leaves the question undecided as to whether trophic disturbances favor the frequent development of the erysipelas germs. KRAHNSTÖVER.

HILLEMANNS (449) in partial trichiasis uses the Schleich method of anæsthesia and excises a portion of skin and muscle as in Snellen's entropium operation, and destroys with the cautery the roots of the lashes which present themselves as black points. A small wedge-shaped bit of tarsus may be excised also.

In a series of experiments on rabbits, NEUSCHÜLER (450) found that flaps transplanted to the lids healed best when taken from a region where the skin had the same character as the lids. In his rabbits, transplantation of skin from the lid of the other eye was successful in 33 % of cases, while a flap, laid in physiological salt solutions for five minutes and then sutured to the spot from which it was taken, healed in 75 % of cases. When the flaps

were taken from other portions of the body, or from other animals, healing was rare. KRAHNSTÖVER.

VAN DUYSE (451) examined an eight-month, still-born fœtus with microphthalmus, coloboma of the iris and ciliary body, and a colobomatous cyst lying behind the lower lid. From the lower portion of the eyeball a hernia-like projection of the retina passed into the cyst, and within the cyst most of the layers of the retina were found, but they were in reversed order. The central artery lay beneath the optic nerve. The condition of the retinal layers would suggest that a portion of the distal layer of the secondary ocular vesicle never came into contact with the proximal layer, or, after this had taken place, had been forced out again through the fœtal cleft, in consequence of an abnormal accumulation of liquid in the primordial brain. Disturbances of development in the brain cause disturbances in the development of the fœtal cleft, which then appear as colobomas, colobomatous ectasias, and cysts. The different degrees of these anomalies depend upon the time of their appearance and the extent of the changes in the brain. The supposition that an abnormal collection of lymph after the closure of the medullary tube had caused these disturbances was supported in his case by the existence of ependymitis with hydrocephalus. v. MITTELSTÄDT.

ROHMER (453) describes four cases of a rare affection of the lid in which a transverse fold of skin hung down from each upper lid over the margin of the lid and the pupil. The skin of the folds was reddish, had fine folds, and was atrophic. The affection was found only in females, three being between fifteen and sixteen years of age, and one six years of age. It began between the ages of six and ten and attained its full development in the course of several months, and then remained permanently. In all cases there was some vasomotor disturbance, and in emotional states the lids became swollen and bluish-red, in one case even after the fold of skin had been excised. In the excised portion of skin all the layers were found to be atrophic, while the blood and lymph vessels were dilated and the latter were increased in number. The author speaks of other cases that have been described, considers the differential diagnosis, and calls the affection angiomegaly of the upper lids. v. MITTELSTÄDT.

SNÉGUIREW (454) observed in a woman of twenty-four a neurofibroma which had existed since childhood. This arose from the left half of the forehead and a third of the right half, and

covered the left eye and the greater portion of the left half of the face. The tumor was removed at two operations with a week between, the hemorrhage being hard to check on account of the density of the tumor. The skin covering the tumor was normal and, the subcutaneous fat being wanting, was adherent to the tumor. The sweat glands were elongated and about them and deeper in the substance of the tumor were numerous nerves of various thicknesses and running in various directions, the fibres often being non-medullated and at places having varicose thickenings. The author discusses a number of tumors described in literature as elephantiasis, pseudo-elephantiasis, plexiform neuroma, and sclerosing fibroma. The diagnosis can only be made with the microscope. The treatment is operative and usually more than one operation is required. V. MITTELSTÄDT.

After operating on one hundred and thirty lids for entropion, HERBERT (455) thinks the ordinary Snellen's suture insufficient and success depends upon strict attention to the following details:

Ordinary operations consist of removing a wedge-shaped piece of tarsus with its overlying muscle. The points insisted on are:

1. A strip of skin 2 *mm* or more wide should be cut away unless the skin is scanty, otherwise it is redundant.

2. The depth of the incision should in all cases be sufficient to divide completely the tarsus. The depth of the wedge at its base depends largely on the degree of entropion existing. The strip taken should be as near the free margin of the lid as possible.

3. The sutures should be entered, as in Green's operation, behind the posterior lashes and passed obliquely forwards and upwards to be brought out immediately above the lower margin of the skin wound. The needle should be passed into the anterior surface of the upper piece of tarsus distinctly above the cut surface and brought out again after taking a firm hold; neither skin nor muscle is taken up. Three sutures are sufficient.

MARSHALL.

IX.—LACHRYMAL APPARATUS.

456. **Hilbert.** A case of traumatic prolapse of the lachrymal gland. *Klin. Monatsbl. f. Augenheilk.*, xxxviii, p. 478.

457. **Sourdille.** Abscess of the palpebral lachrymal gland of Rosenmüller. *Arch. d'opht.*, xx., 8, p. 433.

458. **Sgrosso.** Epithelioma of the lachrymal sac propagated to the superior maxilla. *Ann. di Ottalm.*, xxix., 1–2, p. 82.

An infant of sixteen months fell and cut the upper lid, so that the lachrymal gland prolapsed. HILBERT (456) abscised the gland, sutured the wound, and obtained a good recovery. The fact that prolapse of this sort occurs only in children is explained by Hilbert as being due to the fact that the margin of the orbit is poorly developed in the child. Other surgeons have replaced the gland; but abscission is not followed by any disturbance of lachrymal secretion. In one case there was a fistula for a time.

SOURDILLE (457) observed in three children, ranging from two to eight and a half years, suppuration of the palpebral lachrymal gland. One child was delicate and frequently had small abscesses on the face, another had hordeola, and the third had recently had measles. At the beginning of the rapidly developing affection the upper lid became red and swollen with slight conjunctival injection and secretion. Movement of the eye was difficult. After a day or two the symptoms increased, particularly toward the outer commissure, and when the upper lid was raised one saw besides the chemotic conjunctiva a tumor which pressed down toward the tendon of the external rectus and in about four days presented pus at its apex. Only in the beginning can the affection be confounded with blennorrhœa. Soon all the symptoms point to the seat of the disease, and the preauricular glands become enlarged.

Suppuration of the orbital lachrymal gland causes more extensive and much severer local and general symptoms, and there is displacement of the immovable ball inward and forward. The pus breaks through the skin beneath the orbital margin where the swelling is greatest.

The infection arises from the ducts entering the conjunctival sac, affects the surrounding connective tissue and the lobules of the gland with the interstitial tissue either directly or through the lymph channels. While suppuration of the orbital gland is a serious affection, suppuration of the palpebral gland never leads to threatening symptoms. v. MITTELSTÄDT.

In SGROSSO'S (458) case, a primary epithelioma of the lachrymal sac, which had grown to the size of a pigeon's egg and involved the upper jaw, was removed successfully by operation.

KRAHNSTÖVER.

X.—ORBIT AND NEIGHBORING CAVITIES.

459. **Magran.** Orbital and palpebral emphysema. *Thèse de Paris*, 1900.

460. **Antonelli.** Hereditary syphilitic periostitis of the orbit. *Sem. méd.*, No. 25, 1900.

461. **Vossius.** A case of echinococcus of the orbit. *Beiträge z. Augenheilk.*, xliv., p. 91.

462. **Isola.** Hydatid cyst of the orbit. *La clinique opht.*, No 11. Echinococcus of the orbit. *Ophth. Klinik*, No. 15.

463. **Domela-Nieuwenhuis.** On the retro-bulbar surgery of the orbit. Bruns's *Beiträge z. klin. Chirurg.*, xxvii, 2–3.

464. **Valude.** Orbital operations according to Krönlein's method. *Ann. d'ocul.*, cxxiv., Aug., 1900, p. 114.

465. **Golowin.** The operative treatment of pulsating exophthalmus. *Zeitschr. f. Augenheilk.*, ix., 3, p. 182.

466. **Vossius.** Observations on diseases of the orbit in inflammatory affections of the nose and the neighboring cavities (empyema), with a case of mucocele of the frontal and ethmoid sinuses. *Ibid.*, ix., pp. 1 and 115.

467. **Lippincott.** Systematic cleansing of the nasal cavities before operations which involve opening the eyeball. *Jour. Am. Med. Assoc.* Oct. 13, 1900.

468. **Hansell.** Tuberculous tumor of the orbit. *Ibid.*, Nov. 10, 1900.

469. **Shoemaker.** The relation of Tenon's capsule and the check ligaments to enophthalmos. Report of a case of enophthalmos. *Annals of Ophth.*, July, 1900.

Vossius (461) describes again a case of echinococcus operated on in 1897 and already reported. The sac was as large as a pigeon's egg, lay in the upper-outer portion of the orbit, had eroded the outer wall of the orbit, had communicated with the frontal sinus, and was adherent to the periosteum. The lachrymal gland was wanting, having been perhaps the point of origin of the cyst. Aspiration revealed a cloudy, yellowish-red liquid without echinococcus hooklets but with crystals of cholesterin and pus corpuscles, indicating that the parasite was dead. There was a low degree of papillitis, but vision was little affected. The cyst was incompletely removed by operation.

Domela-Nieuwenhuis (463), after making experiments in the dead-house, recommends for cutting the bone in the Krönlein operation (1) a small chisel in which the lower part of the vertical edge is ground sharp, and (2) a convex saw. The external rectus suffers more than the other orbital muscles from the cicatrization. The periorbital tissue should be so divided that the scar will lie as far above or below the muscle as possible. One would perhaps

spare the external rectus more if it was divided and sutured together again than if it was pushed aside and crushed in the operation. The levator also is often injured, so that a more or less permanent ptosis results. After Knapp's operation there is ptosis in 50 % of the cases.[1] As regards other anomolies of muscles or of position of the ball the results are about equal in the two operations, normal conditions being obtained in 30 %. Anæsthesia is not so frequent and constant as one would expect after section of the ciliary nerves. Probably branches of the lachrymal nerve from the conjunctiva, which anastomose with the ciliary nerves in the cornea, gradually assume a vicarious function. Nevertheless it is well to suture the lids after the Krönlein operation on account of the danger of corneal anæsthesia and also of retrobulbar hemorrhage. The Krönlein operation seems justifiable for diagnostic purposes.

Golowin (465) treated two patients with pulsating exophthalmus by ligating the orbital veins, once in the inner angle of the orbit beneath the brow, and the other time at the apex of the orbit also, after temporary resection of the orbital wall and the external rectus muscle. Golowin advises the ligation of the superior ophthalmic vein and if necessary the artery also. In every case digital compression of the carotid must be tried. If there is a new formation of vessels in the orbit or if there are symptoms of vascular dilatation limited to the orbit or the orbit and the face, ligation of these vessels should be done by entering the orbit from in front or by Krönlein's method. If further symptoms, such as sounds in the head and giddiness indicate an extensive disturbance in the course of the carotid, the common carotid is to be ligated. If this is not followed by the desired result the ligation of the vessels at the apex of the orbit may help, perhaps by causing a thrombus that extends centripetally.

Vossius (466) believes that only empyema is found in the sphenoid sinus, while in the antrum and frontal sinus mucocele may exist. Empyemas usually cause marked symptoms, such as fever, headache, and a considerable discharge of pus from the nose. Often, too, there are inflammatory changes in the soft parts about the eye which may affect the optic nerve and the veins and thus not only injure vision but even threaten life. From the antrum the brain is rarely involved; from the frontal sinus the brain is affected after destruction of the posterior bony wall; and

[1] This is exaggerated.—Ed.

from the sphenoid and ethmoid inflammations are readily transmitted to the brain. Sphenoid affections lead to thrombosis of the cavernous sinus, suppuration in the frontal sinus to intracranial abscess, and ethmoid affections to meningitis and brain abscess. The frequency of disease of the accessory cavities is doubtless greater than is generally supposed. According to Germann, every case of orbital suppuration is due to suppuration of an accessory cavity. Special investigations in the dead-house revealed 40 % of affections of the accessory sinuses which had not been diagnosed in life.

The venous anastomoses are responsible for the extension of these affections to other parts.

Mucoceles develop for years, gradually thinning and distorting the bones and displacing neighboring organs. Their origin may be traumatic, as may also be their change to empyemas, which may cause acute symptoms. Mucocele of the ethmoid may simulate an ectasia of the lachrymal sac. The displaced eyeball suffers from compression and incomplete protection.

Several clinical histories by the author and others illustrate the difficulty of diagnosing diseases of the accessory cavities.

LIPPINCOTT (467) sprays the nose with permanganate of potash (1:2000) a few hours before operating. In his last 152 operations in which the globe was penetrated, there was not only complete absence of suppuration but also an unusual degree of freedom from inflammation or irritation of any kind. ALLING.

HANSELL'S (468) case was in a girl of thirteen who presented a hard and inelastic tumor, which projected about two millimetres beyond the edge of the orbit and was attached to the roof of the orbit a little back of the margin. The upper lid was swollen and drooping. The family history showed no tuberculosis. The patient was anæmic, but apparently in good health. The tumor was enucleated without disturbing the eyeball and proved to be, beyond doubt, primarily tuberculous, with added infection inducing leucocytic infiltration. No tubercle bacilli were discovered. He was unable to find any similar case in ophthalmic literature. ALLING.

It seems to SHOEMAKER (469), since the eyeball is held forward in its natural position by the orbital fascia, which, from its attachment to the edge of orbit, passes back of the eyeball, that enophthalmos will result from injury or disease of this structure, *e. g.*,

paralysis of the smooth muscle-fibres known to exist in the check ligaments, or rupture of the check ligaments or fascia. The case he reports was struck in the right eye by a ball. The lids were emphysematous, and a small hemorrhage in the anterior chamber. No view of the fundus could be obtained. Two weeks and a half later vision was $\frac{6}{15}$, moderate enophthalmos. After two years and a half the eye was $2\frac{1}{2}$ *mm* lower than the other and had receded 2 *mm* into the orbit. ALLING.

XI.—CONJUNCTIVA.

470. **Draudt.** Conjunctivitis and episcleritis necroticans. *Inaug. Dissert.*, Heidelberg, 1900.

471. **Denig.** The simultaneous existence of pneumococcus-conjunctivitis and pneumococcus-angina. *Zeitschr. f. Augenheilk.*, iv., 3, p. 213.

472. **Natanson.** Blennorrhœa in the new-born in consequence of congenital atresia of the nasal duct. *Medicius Koje Obosreiye*, March–April, 1900.

473. **De Lapersonne** and **Painblau.** Abrin in trachoma. *Arch. d'opht.*, xx., No. 8, p. 401.

474. **Lagrange** and **Cabannes.** A case of primary tuberculosis of the conjunctiva. *Arch. d'opht.*, xx., No. 7, p. 353.

475. **Pihl.** Two cases of vaccine conjunctivitis. *Klin. Monatsbl. f. Augenheilk.*, xxxviii., p. 454.

476. **Forster.** Vaccine affections of the eye. *Münch. med. Wochenschr.*, 1900, p. 1090.

477. **Anastasi.** A case of subconjunctival cysticercus. *La clin. oculista*, Sept., 1900.

478. **Hirsch, Camill.** The unpigmented nævus of the conjunctiva. *Zeitschr. f. Augenheilk.*, iv., p. 25.

479. **Reis, W.** A case of teleangiectatic angioma of the bulbar conjunctiva with cyst formation. *Klin. Monatsbl. f. Augenheilk.*, xxxviii., p. 559.

480. **Scholtz.** Subconjunctival angioma. *Orvosi Hetilap*, 1900, No. 43.

481. **Best.** The pathology of tumors of the conjunctiva (papilloma, epithelial pinguecula, keratosis). *Klin. Monatsbl. f. Augenheilk.*, xxxviii., p. 543.

482. **Duboys de Lavigeri.** Epithelial cysts of the conjunctiva. *Bull. de la Soc. d'opht. de Paris*, May 1, 1900.

DRAUDT (470) reports from Praun's clinic the case of a woman of twenty-five, who had suffered from chlorosis, hysteria, tuberculosis, ulcer of the stomach, and chronic endometritis. In the summer of 1895 an ulcer appeared, extending down into the sclera, followed by others, so that since 1899 she had never been free from ulcers. There was no conjunctivitis. At intervals one or more small white episcleral patches appeared, over which the conjunctiva soon was cast off, and a gray ulcer was formed, extending down to the sclera. In two or three weeks a gray or

yellow scar remained. The ulcer appeared always in the upper half of the bulbar conjunctiva, sometimes in one eye and sometimes in the other. The sensibility of the cornea and conjunctiva was always normal and vision was never interfered with. Bacteriological examinations were always negative. Cauterization alone relieved the pain and had a favorable effect.

DENIG's (471) patient had an acute croupous conjunctival inflammation and a mild inflammation of the throat. The conjunctival secretion contained pneumococci in pure culture, and the secretion from the throat contaned pneumococci mixed with other micro-organisms, staphylococci in particular.

According to DE LAPERSONNE and PAINBLAU (473) abrin solution, when applied to the conjunctiva of the rabbit, causes, as in cases of trachoma in man, a large accumulation of multinuclear and uninuclear leucocytes, loss of epithelium, and sero-fibrinous exudation. The solution is obtained by macerating for twenty-four hours 1 gramme of jequirity powder in 100 grammes of water with the addition of some drops of chloroform, and filtering. If an antitoxic serum obtained from rabbits is instilled six hours after the application of abrin, its effect is neutralized. When instilled twenty-four hours after the use of abrin, the inflammation runs a much milder course; but when instilled later the antitoxin has no effect.

Abrin has no specific action upon the granulations, but they are caused to disappear only through the conjunctival changes that are brought about. v. MITTELSTÄDT.

LAGRANGE and CABANNES (474) observed in a healthy child of sound parents a primary tuberculosis of the upper lid and conjunctiva developing after an injury. On the tarsal conjunctiva were about eighteen yellowish trachoma-like granules, which in the course of two weeks ulcerated. There was an ulcer 1 *cm* in diameter in the retrotarsal fold. A lymphatic gland in front of the ear and one at the angle of the lower jaw were swollen. Inoculations in guinea-pigs were unsuccessful, although tubercle bacilli were present. Scraping of the ulcers and iodoform massage, together with general treatment, led to rapid and permanent recovery. v. MITTELSTÄDT.

The subconjunctival cysticercus observed by ANASTASI (477) lay in the lower fornix, and the vesicle extended to the tendon sheath of the inferior rectus. The author believes that the diagnosis can always be made, since the condition could be con-

founded only with a cyst of Krause's glands, which, however, is never in such intimate relation with the sclera or the eye muscles, and whose surface is never so flat as that of the cysticercus vesicle. KRAHNSTÖVER.

REIS's (479) case was one of simple hypertrophic angioma with cysts. A yellow-brown area about 1 *cm* in diameter and 1 *mm* thick lay in the episcleral tissue near the temporal margin of the cornea. It had grown little since birth. It was extirpated and microscopically was seen to be composed of capillaries with a dilated lumen and thickened walls, and of cavities which were formed by the indipping of epithelium and the confluence of these to great cysts.

XII.—CORNEA.

483. **Grunert.** On annular keratitis. *Klin. Monatsbl. f. Augenheilk.*, xxxviii,, *Beilageheft*, p. 10.

484. **Soncek.** A case of parenchymatous keratitis in acquired syphilis. *Zeitschr. d. tschechischen Aerzte*, 1900, Nos. 32, 33.

485. **Terrien.** On parenchymatous keratitis as an early manifestation of ophthalmic zona. *Arch. d'opht.*, xx., 8, p. 449.

486. **Fuchs.** On the clearing up of corneal scars. *Beiträge z. Augenheilk.*, 44, p. 117.

487. **Steiner.** On the migration of India ink from tattooed leucomata. *Centralbl. f. prakt. Augenheilk.*, xxiv., p. 257.

488. **Helbron.** An unu-ual case of cholesterin formation in the anterior chamber, with the pathological examination. *Zeitschr. f. Augenheilk.*, iv., 3, p. 200.

489. **Sattler.** The surgical treatment of conical cornea. *Journ. Amer. Med. Assoc.*, Aug. 18, 1900.

490. **Knapp, H.** The treatment of keratoconus with the galvano-cautery, *Ibid.*

491. **Martin.** Keratitis ulcerativa marginalis. *Ophth. Record*, Aug., 1900.

492. **Burnett, S. M.** The optical treatment of conical cornea. *Annals of Ophth.*, Oct., 1900.

493. **Suker.** Keratitis petrificans. The correct terminology for ribband-like keratitis. *Ophth. Record*, Nov., 1900.

In GRUNERT'S (483) keratitis annularis the cornea exhibits infiltrations, deep in the parenchyma and away from the margin, in the form of rings which in part become ulcers and in their retrogression often break up into individual foci. The rings were often excentric in respect to the periphery, were not always round, and sometimes lay three within one another. In the middle of these figures the cornea was densely hazy, but around them clear or nearly so. The ulcers that developed corresponded

closely with the infiltrations. In one case the epithelium over the ring retained its lustre, while in one-third of the cases herpes vesicles were present at the same time. In the stage of absorption deep-lying vessels made their appearance. The opaque figures were composed of fine grayish-white points. Grunert saw the disease unilateral in one eye only in seven cases, and in both eyes in one case, without any dependence upon other diseases of the organism. In respect to its development and course Grunert distinguishes this affection altogether from parenchymatous keratitis due to hereditary syphilis. The formation of vesicles and the anæsthesia of the cornea cause it to approach nearer to herpes zoster or to the keratitis profunda of Arlt.

Soncek (484) reports a case of parenchymatous inflammation of the cornea in a man of twenty-eight who had acquired syphilis five years before. A year after the primary infection a gummous periostitis developed on the left upper arm, and later the cornea became affected. The low degree of pain, the rapid improvement under antisyphilitic treatment, and the general enlargement of the glands justified the assumption that syphilis was the sole cause of the inflammation. Herrnheiser.

In Terrien's (485) case the parenchymatous keratitis did not as usual follow the cutaneous eruption of herpes zoster, but preceded it. The inner-upper sector of the cornea, whose surface was quite smooth, was infiltrated up to the middle of the cornea and the adjoining sclera was inflamed. While this condition remained unchanged, a herpes eruption appeared two weeks later on the inner half of the forehead and soon after several herpes vesicles appeared on the sclera near the limbus, vanished, and several times returned. The further course of the affection was mild. v. Mittelstädt.

Fuchs (486) completes his remarks on the nature of old scars of the cornea, made in 1893. In scars which have formed in childhood after scrofulous or other superficial ulcers and not after deep destructive processes, such as blennorrhœic or serpent ulcer, one finds in advanced age black lines arranged irregularly, or branching birch-broom fashion toward the centre of the cornea, or including rhomboid cloudy fields. They do not resemble blood-vessels and Fuchs believes that they represent interposed normal corneal tissue of later growth that takes on this special arrangement in the scar tissue.

Steiner (487), in two patients in whom leucomas of the cornea

had been tattooed respectively two years and five months previously, found that the India ink had for the most part passed out of the leucomas and been deposited in lines and clumps in the neighboring portions of the cornea. A microscopical examination of such an eye showed that the pigment chiefly had followed the course of the vessels.

In HELBRON'S (488) patient, a man of thirty-one, there was an accumulation of cholesterin crystals in a blind and highly myopic eye. Enucleation was done because of increase in tension. Microscopically, the anterior chamber was found to be filled with fibrin, which in part had undergone fatty and in part hyaline degeneration, mixed with cholesterin and blood pigment. The lens contained cholesterin, connective tissue, and chalky deposits, and the anterior capsule was ruptured. Helbron believed the lens to be the primary seat of the cholesterin formation in which also the exudation in the anterior chamber participated.

In view of the possibility of spontaneous arrest SATTLER (489) believes it difficult to decide whether in recent progressive cases it is justifiable to resort to surgical interference, so long as a fraction of useful vision remains. Surgical methods which concern the cornea alone are uncertain in effecting an arrest, and involve exceptional risk, traumatism to the central region of the cornea being especially liable to serious reaction. In desperare cases he suggests removal of lens, galvano-cautery, and iridectomy, if necessary. ALLING.

To six already published, KNAPP (490) adds records of eight eyes treated with galvano-cautery. He uses a convex disc-shaped electrode. In all cases vision was more or less improved. He lays down the following rules: 1. Never cauterize too deeply, and if the result of the first operation be imperfect, apply the electrode again to the place in which you want the subsequent cicatricial contraction to have the greatest effect. 2. Spare, if possible, at least half of the pupillary area. If we operate early, restricting our interference to progressive cases having a clear cornea, the visual as well as the operative result will be the greatest and the reaction the least. ALLING.

MARTIN (491) describes a case which showed a line of small infiltrated spots along the arcus senilis. These broke down, leaving a long ulcer, which encircled the whole cornea. ALLING.

BURNETT (492) regards the ophthalmometer of great value in examining the curve and axes of the cornea, at any particular

point, with a view to determining the proper glasses and in selecting the site of an iridectomy for a new pupil. ALLING.

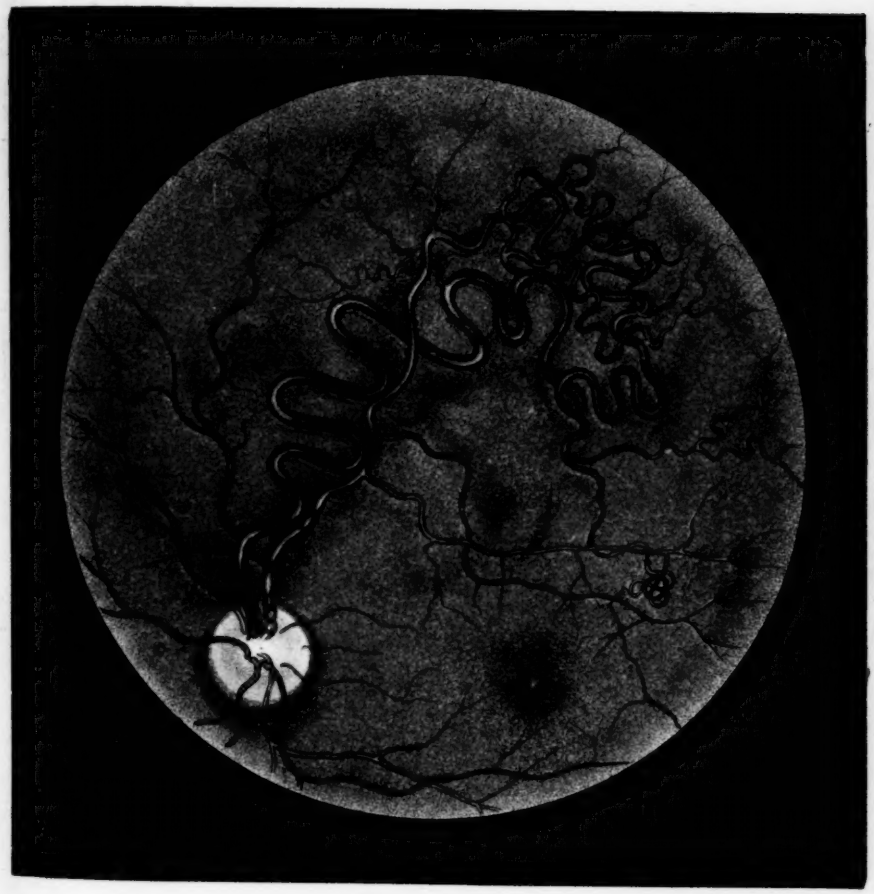
According to SUKER (493) a sharp distinction should be drawn between ribband-like keratitis, which is an infiltration of a colloid mass, and keratitis petrificans, under which title he seeks to class the calcareous deposits which appear as a secondary manifestation. ALLING.

(*To be concluded in our next issue.*)

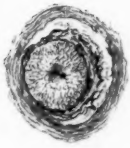
BOOK NOTICES.

IX.—**Retinoscopy.**—By JAMES THORINGTON, A. M., M.D., Philadelphia. 4th edition, revised and enlarged. Small octavo, pp. 86, with 51 illustrations. Price, $1.00. Philadelphia, P. Blakiston's Son & Co., 1901.

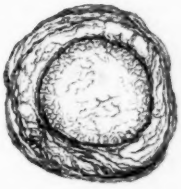
This treatise is a simple exposition of the art of retinoscopy as practised by the method and with the apparatus of the author. Its success, evidenced by the demand for four editions in as many years, doubtless is due to the fact that it is adapted to the needs of the student. For him the descriptions in the general text-books are not sufficiently explicit and dogmatic, and, on the other hand, he is deterred from taking up many of the special treatises on retinoscopy which now abound in every tongue, because they contain mathematical demonstrations of the theory of retinoscopy at which he takes alarm. W. A. H.



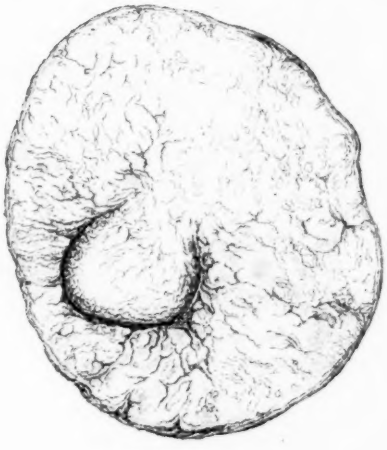
Verlag von J. F. Bergmann, Wiesbaden. Lith. u. Druck. d. kgl. Univers.-Druckerei v. H. Stürtz, Würzburg.



1

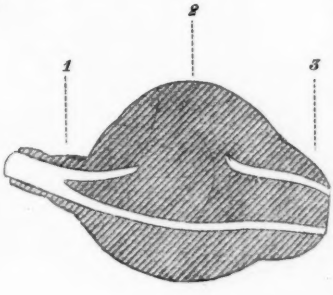


3



2

4



5

Axenfeld del. Lith. Anst. v. H. Jonas, Cassel. Verlag v. J. F. Bergmann, Wiesbaden.